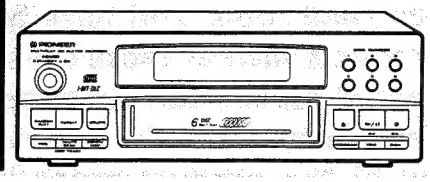
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2390

MULTI – PLAY COMPACT DISC PLAYER

PD-P920M

Type	Power Requirement	Remarks
AUC	AC power supplied from power transformer's secondary of other system component	
AD		
ABXJS		
AEMXJS		

- **This manual is applicable to PD-P920M/AUC, AD, ABXJS and AEMXJS.**
- **For AD, ABXJS and AEMXJS types, refer to page 70.**
- **This product is a component of systems.**
  For the system composition, refer to the system manuals.
- **This product dose not function properly when independent; to avoid malfunctions, be sure to connect it to the prescribed system component(s), otherwise damage may result.**
- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

CONTENTS

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

FN FEB. 1992 Printed in Japan

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SAFETY INFORMATION

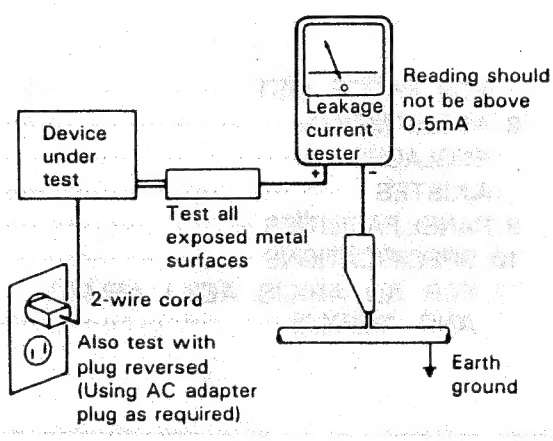
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn
varoitusmerkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

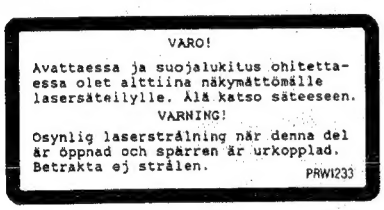
IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF **CLASS 1.**
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

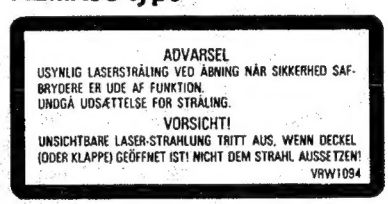
LASER
Picture 1
Warning sign for
laser radiation

LABEL CHECK (MULTI MAGAZINE type)

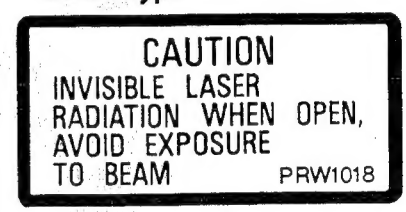
AEMXJS type

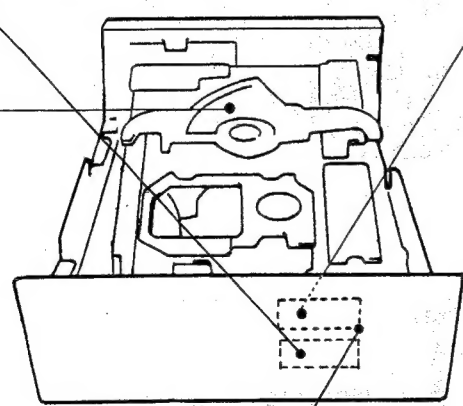


AEMXJS type

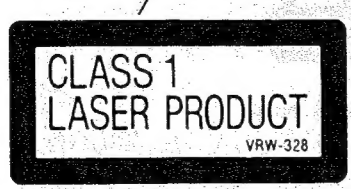


ABXJS type





**AEMXJS type,
ABXJS types**



**AEMXJS type,
ABXJS types**

Additional Laser Caution

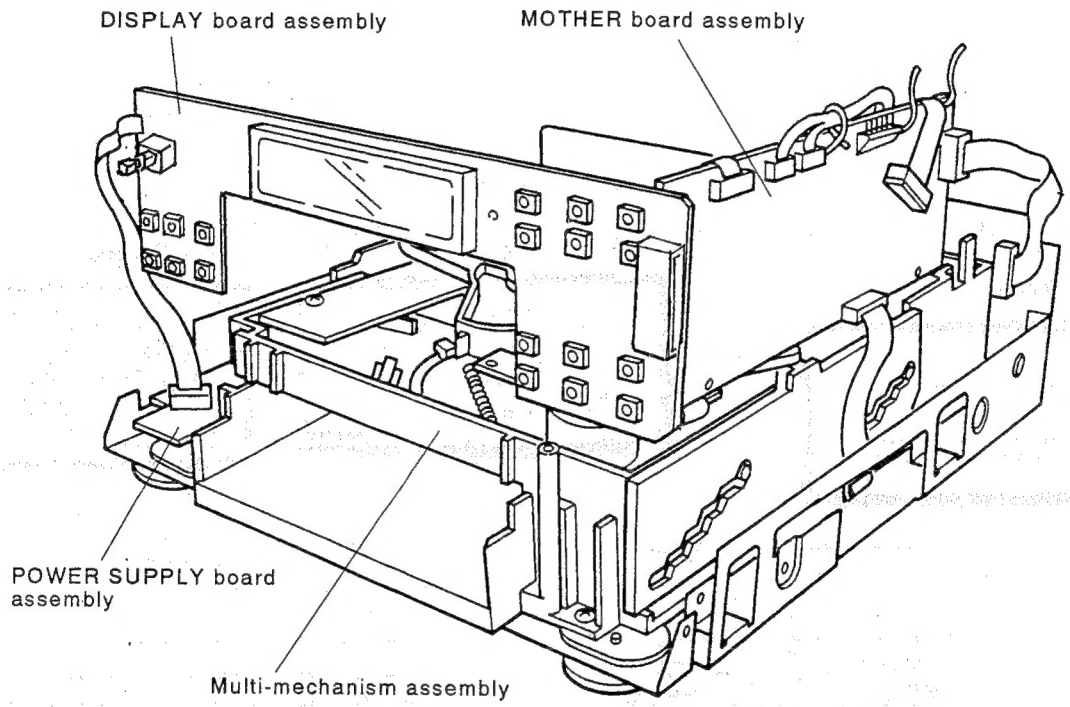
1. Laser Interlock Mechanism
   The ON/OFF (ON : low level, OFF : high level) status of the LPS1 (S601) and LPS2 (S602) switches for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches LPS1 and LPS2 are not ON (low level)(clamped state).
   Thus, interlock will no longer function if switches LPS1 (S601) and LPS2 (S602) are deliberately shorted.
   Also, in the test mode *, the interlock mechanism does not operate too.
   Laser diode oscillation will continue if pins 2 and 3 of CXA1471S (IC101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q101 are shorted to each other (fault condition).

2. When the cover is opened with the servo mechanism block removed to be turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

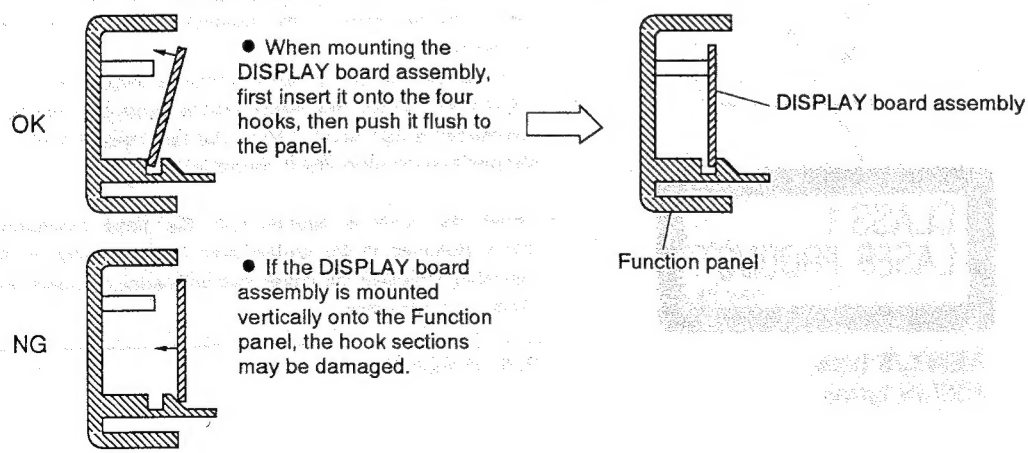
* : Refer to page 30.

2. HOW TO DIAGNOSE THE MOTHER AND DISPLAY BOARD ASSEMBLIES

1. Remove five screws to remove the bonnet.
2. Remove two screws at the under side of the front panel.
3. Pull out the front panel section from the unit.
4. Remove three screws to remove the DISPLAY board assembly and the front panel.



● Notes on mounting of the Display board assembly



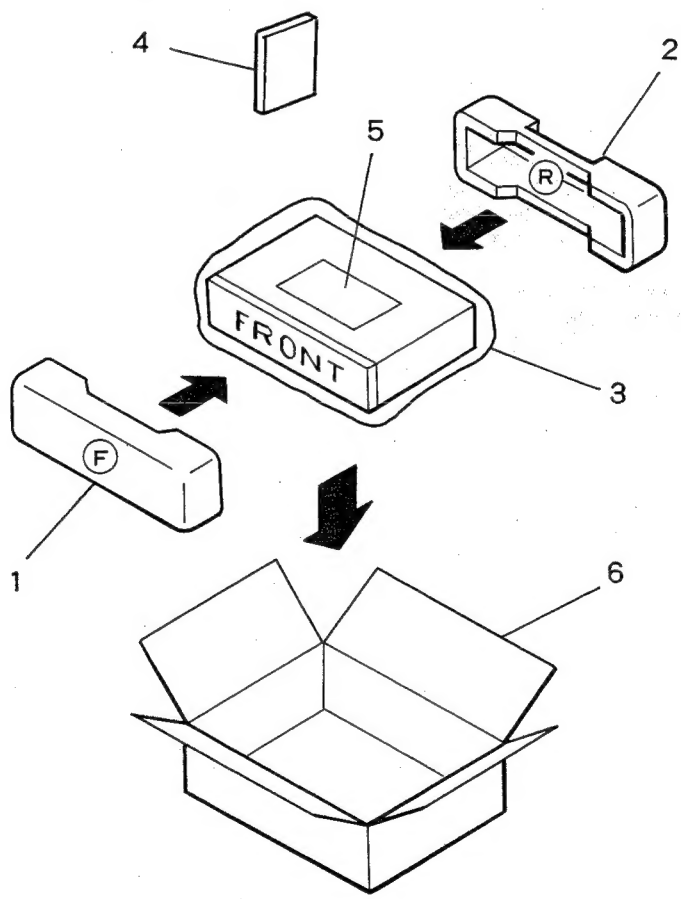
3. PACKING

NOTES:

- *The parts with an encircled number are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Parts List

Mark	No.	Description	Part No.
	1	Protector F	PHA1182
	2	Protector R	PHA1183
	3	Mirror mat sheet	Z23-026
	4	Magazine assembly	PXA1308
	5	Operating instructions (English, French)	PRE1158
	6	Packing case	PHG1802



4.EXPLODED VIEWS AND PARTS LIST

NOTES:

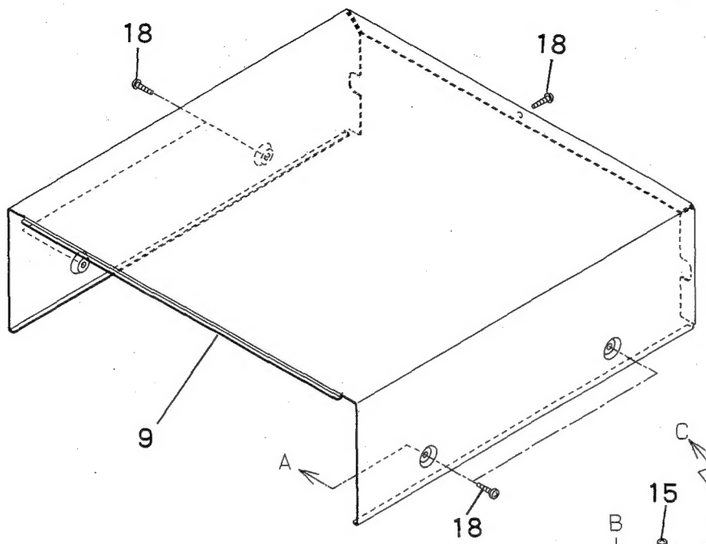
- *The parts with an encircled number are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

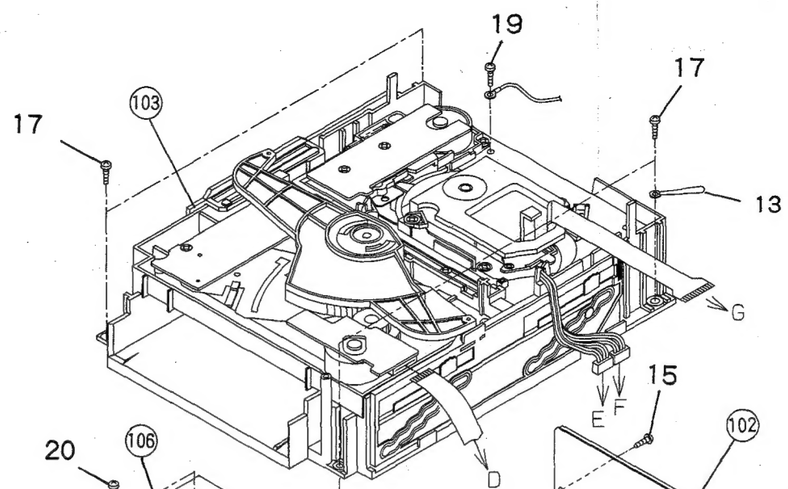
4.1 EXTERIOR

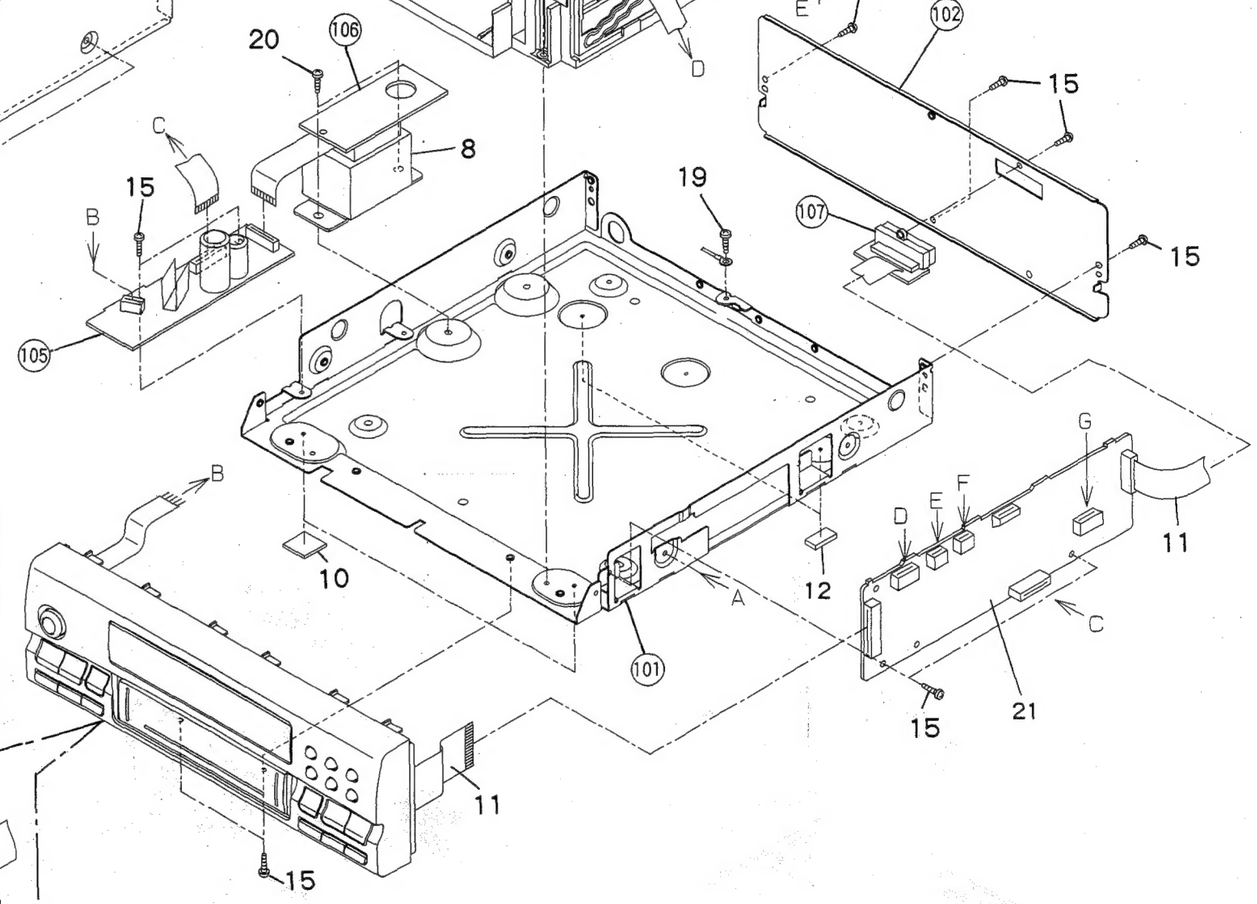
Parts List

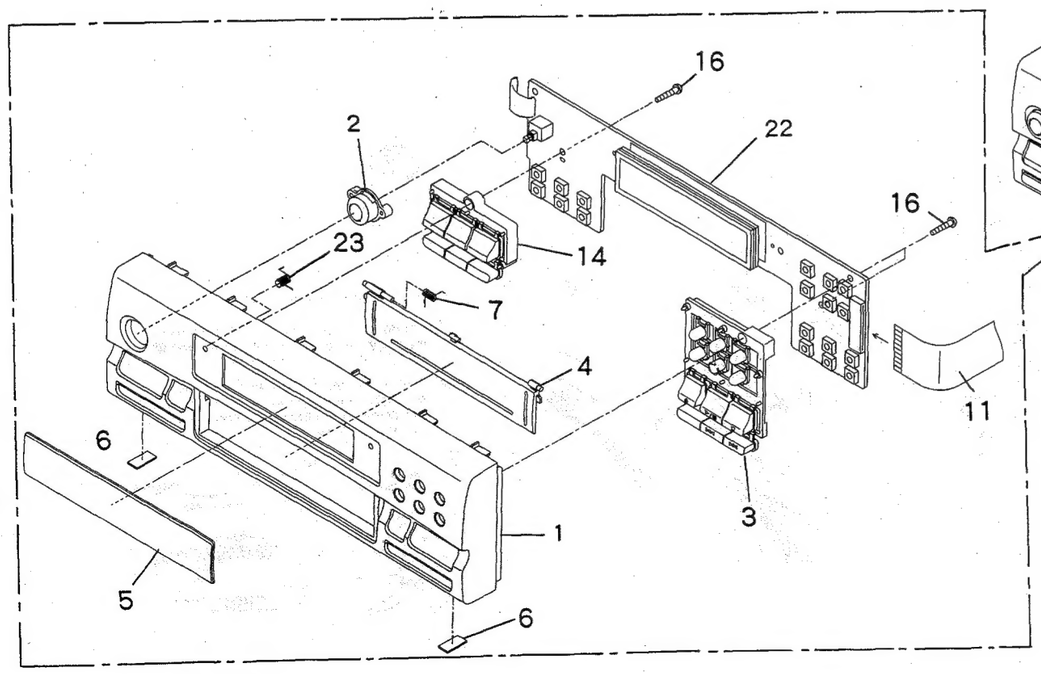
Mark	No.	Description	Part No.
	1	Function panel	PNW2083
	2	Power button	PAC1606
	3	Function button	PAC1613
	4	Door	PNW2101
	5	Display window	PAM1537
	6	Stopper	AEB1111
	7	Door spring	PBH1022
⚠	8	Power transformer	PTT1239
	9	Bonnet	PNA1715
	10	Spacer	PEB1206
	11	Connection cable	PDD1114
	12	Cushion	PEB1207
	13	Cord clamper	RNH-184
	14	Mode button	PAC1614
	15	Screw	BBZ30P060FZK
	16	Screw	PPZ30P120FMC
	17	Screw	BBZ30P080FMC
	18	Screw	BDZ30P060FZK
	19	Screw	PDZ30P050FMC
	20	Screw	PSA40P060FMC
◉	21	MOTHER board assembly	PWM1640
◉	22	FUNCTION board assembly	PWZ2197
	23	Earth spring	PBH1143

Mark	No.	Description	Part No.
	101	Under base	PNA1582
	102	Rear base	PNA1755
	103	Multi mechanism assembly	PXA1358
	104	----	
	105	POWER SUPPLY board assembly	PWZ2198
	106	TRANSFORMER board assembly	PWZ2246
	107	CONNECTOR board assembly	PWZ2249


18
18
9
A
18


19
17
103
17
13
G
E
F
D

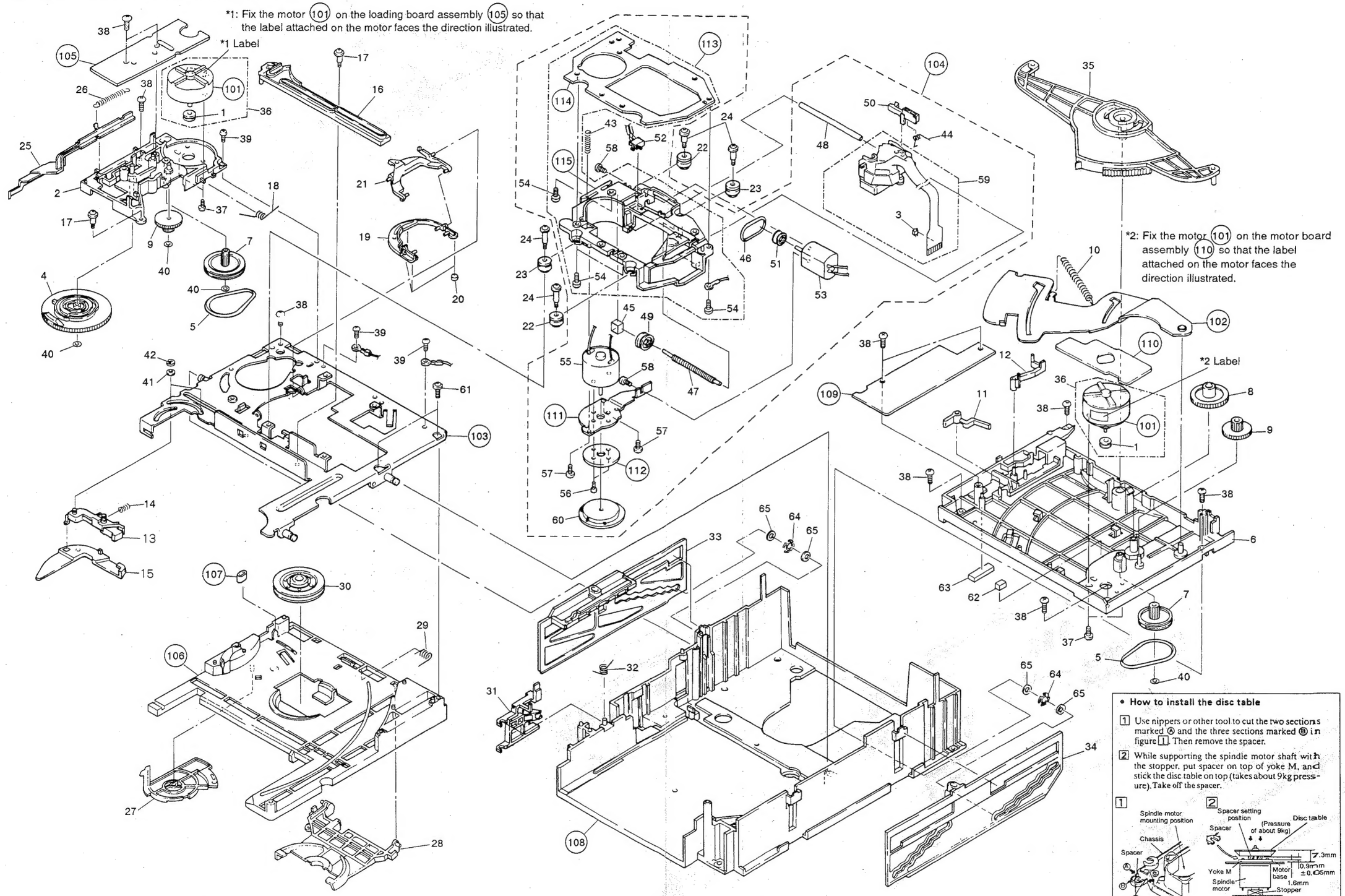

20
106
C
8
15
B
105
19
15
102
15
107
15
B
10
A
101
12
D
E
F
G
11
C
15
21
11
15


16
2
22
16
23
14
7
4
11
6
1
3
5
6

4.2 MULTI MECHANISM ASSEMBLY

*1: Fix the motor (101) on the loading board assembly (105) so that the label attached on the motor faces the direction illustrated.

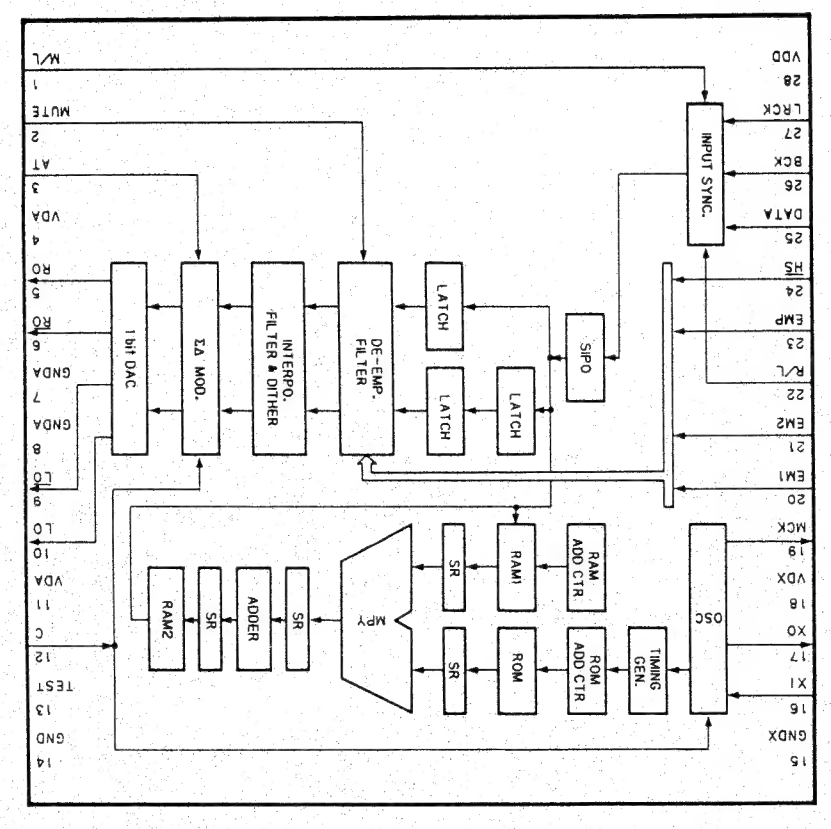
*2: Fix the motor (101) on the motor board assembly (110) so that the label attached on the motor faces the direction illustrated.



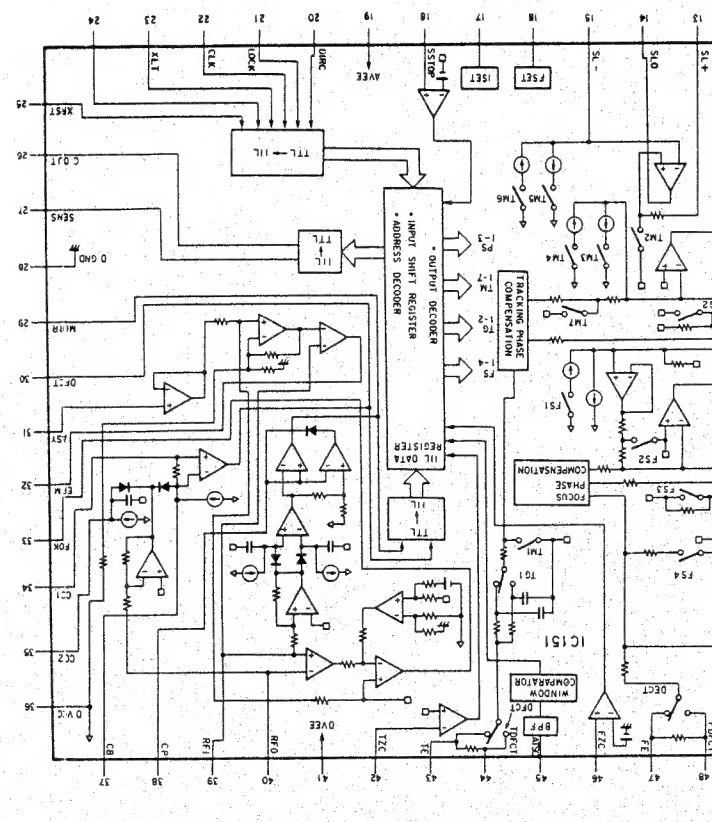
• **How to install the disc table**

1 Use nippers or other tool to cut the two sections marked Ⓐ and the three sections marked Ⓑ in figure 1. Then remove the spacer.

2 While supporting the spindle motor shaft with the stopper, put spacer on top of yoke M, and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



TC9237BF



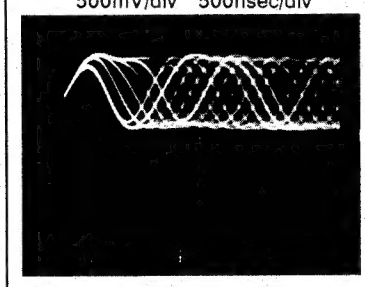
A1372Q

5. SCHEMATIC DIAGRAM

5.1 WAVE FORMS

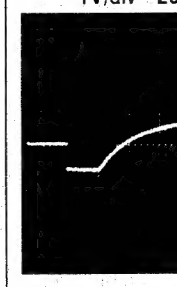
Note: The encircled numbers denote measuring in the schematic diagram.

② TP1 - Pin 1:PLAY MODE
(RF)
500mV/div 500nsec/div

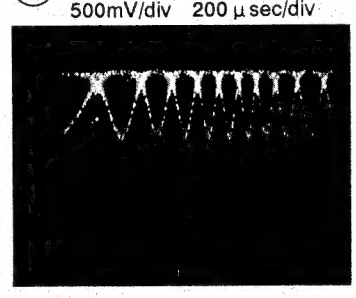


— GND

⑤ IC202 - Pin
(FODR)
1V/div 20

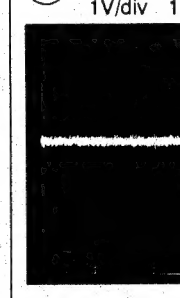


② TP1 - Pin 1:TRACK SEARCH MODE
(RF)
500mV/div 200 μsec/div

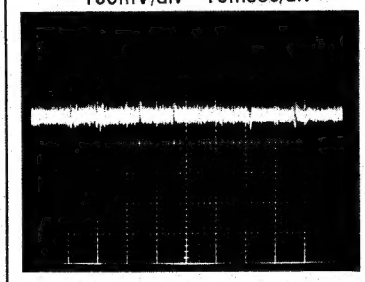


— GND

⑤ IC202 - Pi
(FODR)
1V/div 1



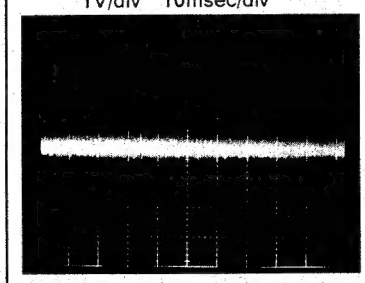
③ TP1 - Pin 6:PLAY MODE
(FOER)
100mV/div 10msec/div



— GND

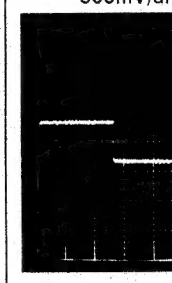
⑥ IC202 - Pi
(TRDR)
500mV/di

④ TP1 - Pin 2:PLAY MODE
(TRER)
1V/div 10msec/div

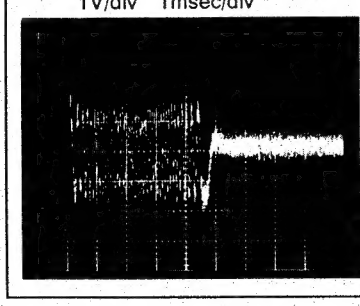


— GND

⑥ IC202 - Pi
(TRDR)
500mV/di

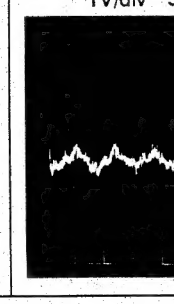


④ TP1 - Pin 2:50T - JUMP (*1) MODE
(TRER)
1V/div 1msec/div



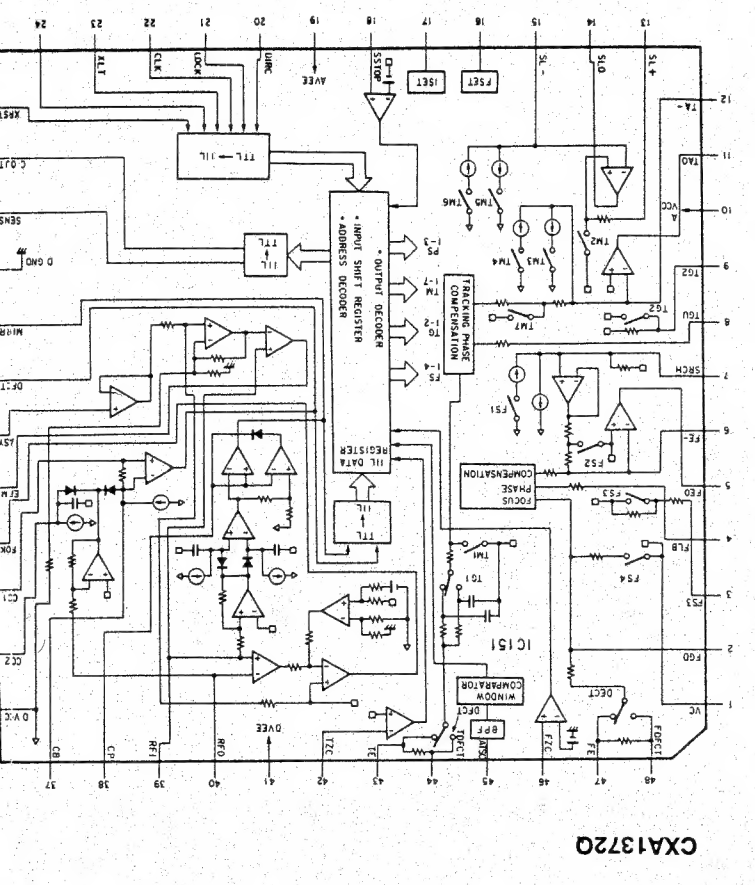
— GND

⑦ IC201 - P
(SPDR)
1V/div 5

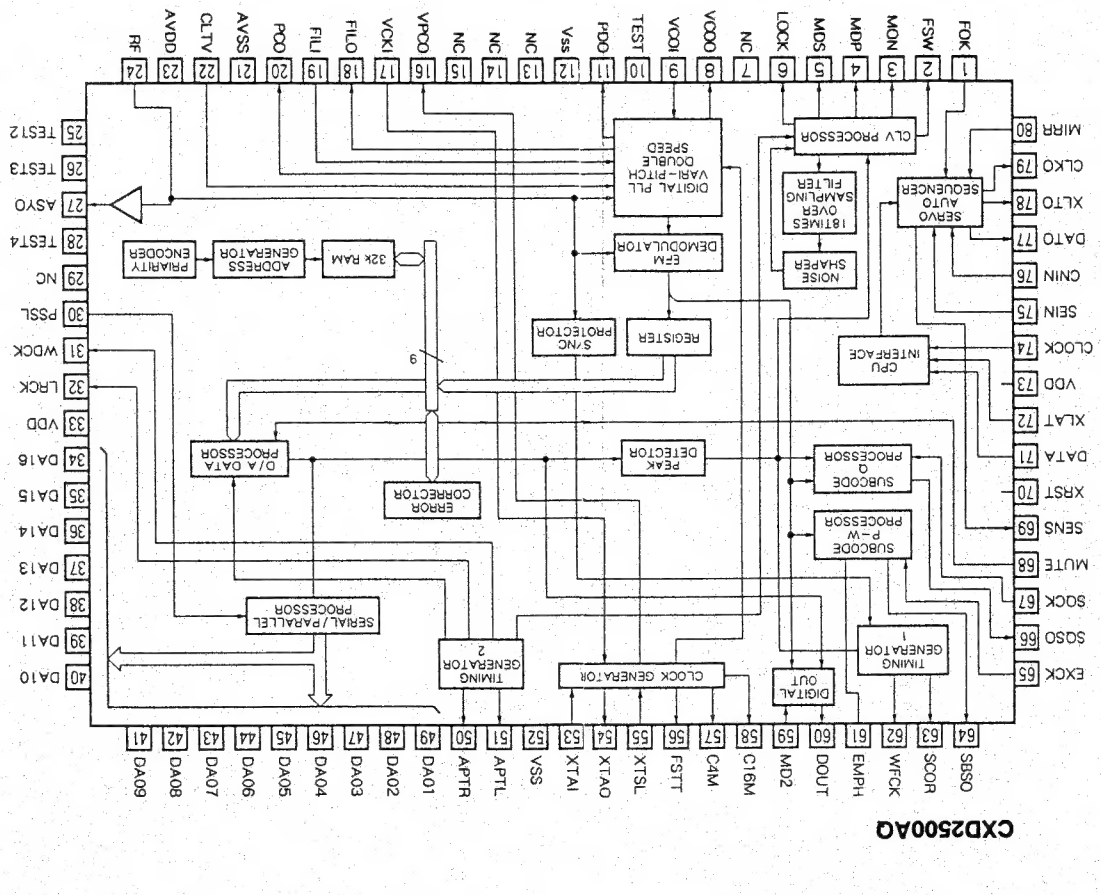


Parts List

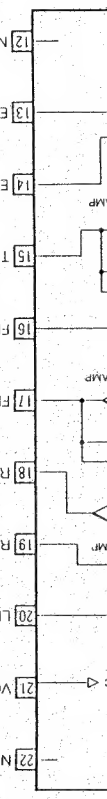
Mark	No.	Description	Part No.
	1	Motor pulley	PNW1634
	2	Gear holder	PNW1929
	3	Semi-fixed resistor (VR1)	PCP1008
	4	Cam gear	PNW1923
	5	Belt	PEB1138
	6	Top guide	PNW1914
	7	Gear pulley	PNW1918
	8	Gear S	PNW1919
	9	Gear L	PNW1920
	10	Eject spring	PBH1107
	11	Switch lever	PNW1927
	12	Seven bar	PNW1931
	13	Sub rotary lever	PNW1933
	14	Sub rotary lever spring	PBH1111
	15	Rotary lever	PNW1932
	16	Drive plate	PNW1930
	17	Motor screw	PBA-112
	18	Holder lever spring	PBH1110
	19	Disc holder	PNW1924
	20	Cushion A	PED1001
	21	Holder lever	PNW1925
	22	Float rubber	PEB1014
	23	Float rubber	PEB1132
	24	Float screw	PBA1055
	25	Release lever	PNW1934
	26	Release spring	PBH1106
	27	Clamper cam	PNW1922
	28	Clamper holder	PNW1921
	29	Clamper spring	PBH1109
	30	Clamper	PNW1857
	31	Lock lever	PNW1917
	32	Lock spring	PBH1108
	33	Stair L	PNW1915
	34	Stair R	PNW1916
	35	Synchronize lever	PNW1926
	36	Motor assembly (LOADING, DISC SELECT)	PEA1130
	37	Screw	PMZ26P040FMC
	38	Screw	PPZ30P080FMC
	39	Screw	BBZ30P060FMC
	40	Washer	WT26D047D025
	41	Washer	WA31D054D025
	42	E ring	Z39-010
	43	Earth spring	PBH1009
	44	Drive spring	PBH1084
	45	Plate spring	PBK1057
	46	Belt	PEB1072
	47	Drive screw	PLA1003
	48	Guide bar	PLA1071
	49	Pulley	PNW1066
	50	Half nut	PNW1605
	51	• • • • •	
	52	Push switch (INSIDE)	DSG1014
	53	D.C.motor (CARRIAGE)	PXM1013
	54	Screw	PBZ30P080FMC
	55	D.C.motor assembly (with oil)(SPINDLE)	PEA1028
	56	Screw	JFZ20P040FMC
	57	Screw	BPZ20P080FZK
	58	Screw	PMZ20P030FMC
	59	Pickup assembly	PEA1030
	60	Disc table assembly	PEA1035
	61	Screw	IPZ30P080FMC
	62	Rubber spacer	PEB1178
	63	Rubber spacer	PEB1179
	64	Silent ring	PBK1093
	65	Washer	WA62D130D025
	101	Motor	VXM1033
	102	Eject lever	PNB1306
	103	Upper chassis	PNB1267
	104	Servo mechanism assembly M	PXA1364
	105	Loading board assembly	PWZ2038
	106	Sub chassis	PNW2027
	107	Rubber tube	PEB1171
	108	Main chassis	PNW2026
	109	Select board assembly	PWZ2039
	110	Motor board assembly	PWZ2040
	111	Motor base	PNB1211
	112	Yoke M	PNB1227
	113	Mechanism base assembly T	PXA1294
	114	Mechanism base	PNB1230
	115	Mechanism chassis	PNW1604



CXA1372Q



CXD2500AQ



5. SCHEMATIC DIAGRAM

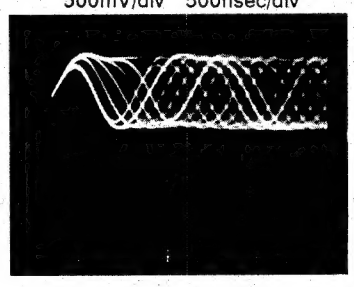
5.1 WAVE FORMS

Note: The encircled numbers denote measuring in the schematic diagram.

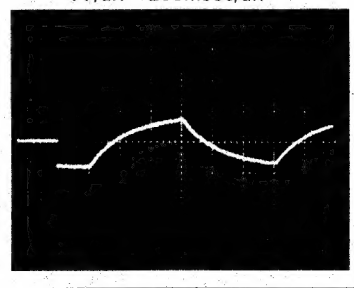
*1 50T-JUMP: After switching to the pause mode, press the manual search key.

*2 FOCUS-IN: Press the key without loading a disc.

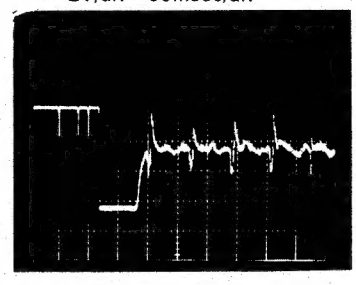
② TP1 - Pin 1: PLAY MODE (RF) 500mV/div 500nsec/div



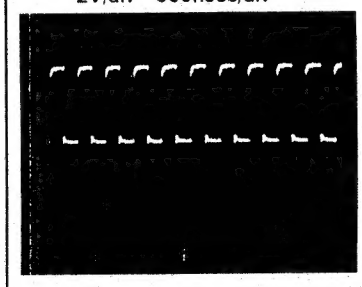
⑤ IC202 - Pin 4: FOCUS - IN (*2) MODE (FODR) 1V/div 200msec/div



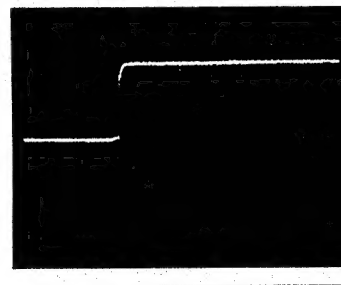
⑦ IC201 - Pin 3: TRACK SEARCH MODE (SPDR) 2V/div 50msec/div



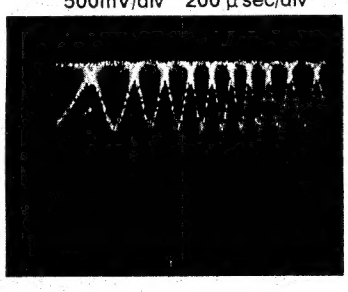
⑯ IC301 - Pin 35: PLAY MODE (1kHz) (BCLK) 2V/div 500nsec/div



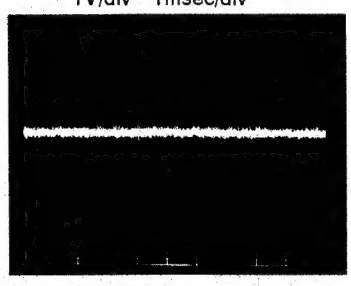
㉒ IC20 - Pin 9: POWER SWITC (RST) 2V/div 100msec/div



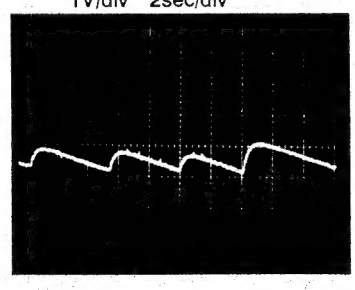
② TP1 - Pin 1: TRACK SEARCH MODE (RF) 500mV/div 200 μsec/div



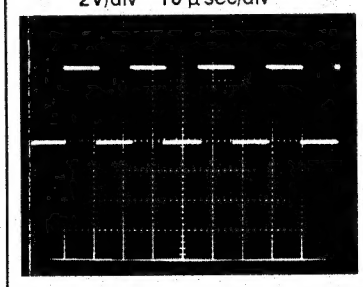
⑤ IC202 - Pin 4: PLAY MODE (FODR) 1V/div 1msec/div



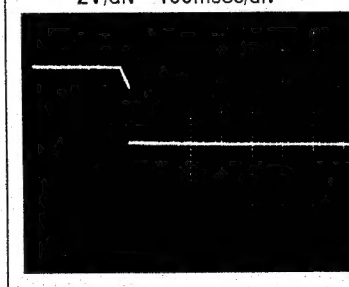
⑧ IC202 - Pin 9: PLAY MODE (CADR) 1V/div 2sec/div



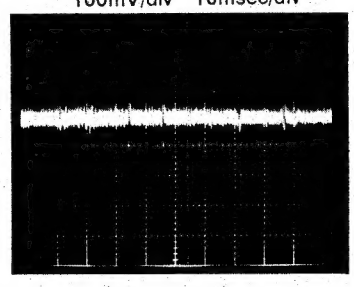
⑱ IC301 - Pin 32: PLAY MODE (1kHz) (LRCK) 2V/div 10 μsec/div



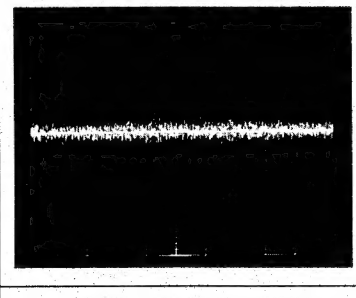
㉒ IC20 - Pin 9: POWER SWITCH (RST) 2V/div 100msec/div



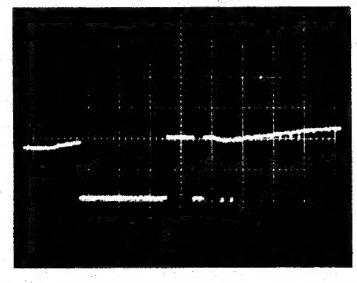
③ TP1 - Pin 6: PLAY MODE (FOER) 100mV/div 10msec/div



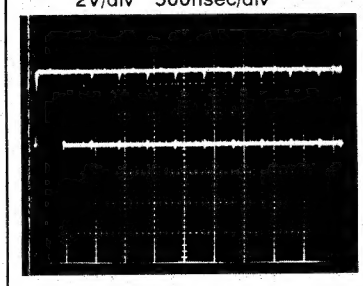
⑥ IC202 - Pin 3: PLAY MODE (TRDR) 500mV/div 1msec/div



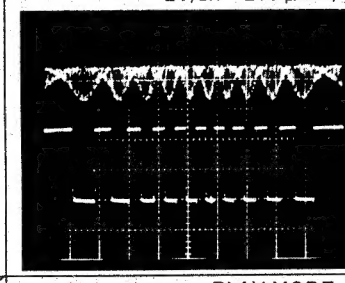
⑧ IC202 - Pin 9: TRACK SEARCH MODE (CADR) 2V/div 200msec/div



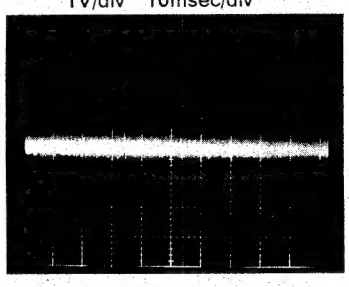
⑲ IC301 - Pin 34: PLAY MODE (1kHz) (DATA) 2V/div 500nsec/div



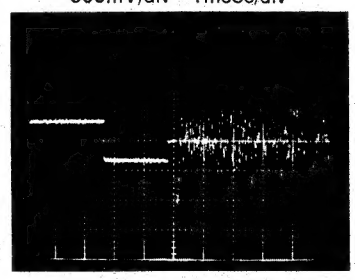
㉓ : TRACK SEARCH M
Upper: TP1 - Pin 1 (RF) 1V/d
Lower: IC151 - Pin 29 (MIRR)
2V/div 200 μsec/d



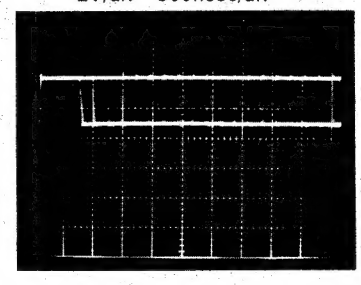
④ TP1 - Pin 2: PLAY MODE (TRER) 1V/div 10msec/div



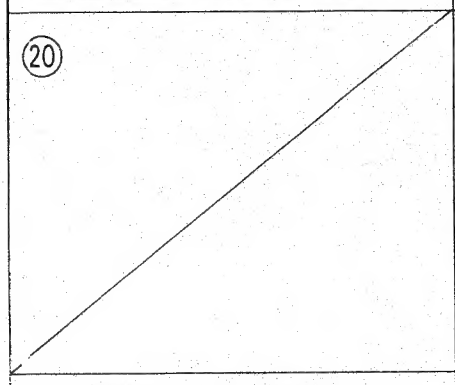
⑥ IC202 - Pin 3: 50T-JUMP (*1) MODE (TRDR) 500mV/div 1msec/div



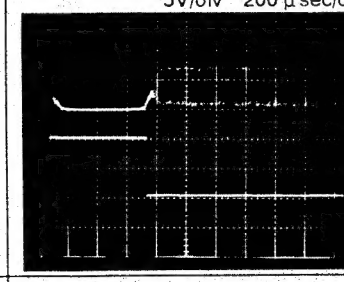
⑨ IC151 - Pin 32: PLAY MODE (EFM) 2V/div 500nsec/div



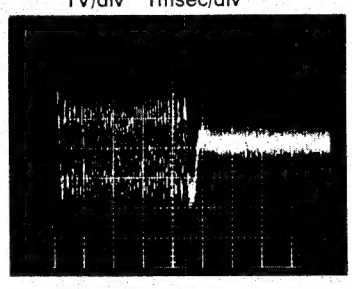
⑳



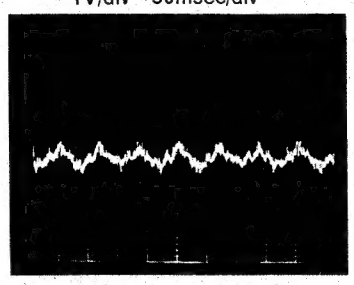
㉔ : PLAY MODE
Upper: TP1 - Pin 1 (RF) 1V/d
Lower: IC151 - Pin 30 (DFCT
5V/div 200 μsec/d



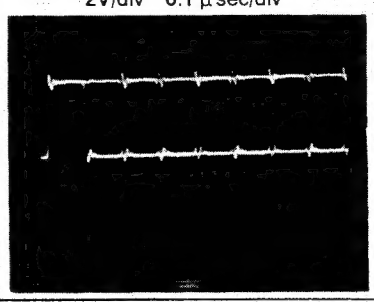
④ TP1 - Pin 2: 50T-JUMP (*1) MODE (TRER) 1V/div 1msec/div



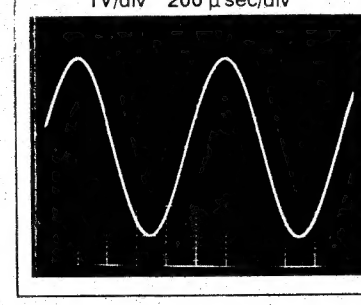
⑦ IC201 - Pin 3: PLAY MODE (SPDR) 1V/div 50msec/div



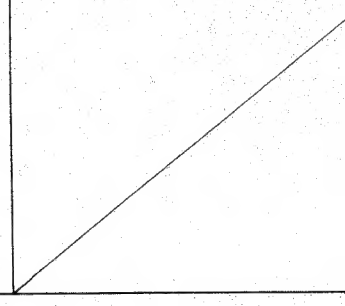
⑩ IC401 - Pin 9: PLAY MODE (D/A DATA OUT) 2V/div 0.1 μsec/div



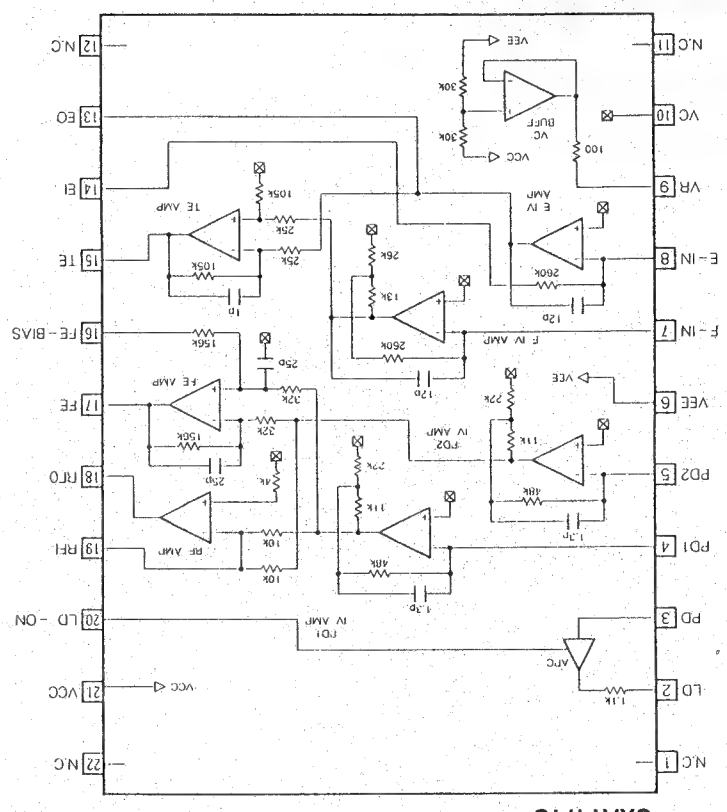
㉑ CN381 - Pin1: PLAY MODE (1kHz) (L ch OUTPUT) 1V/div 200 μsec/div



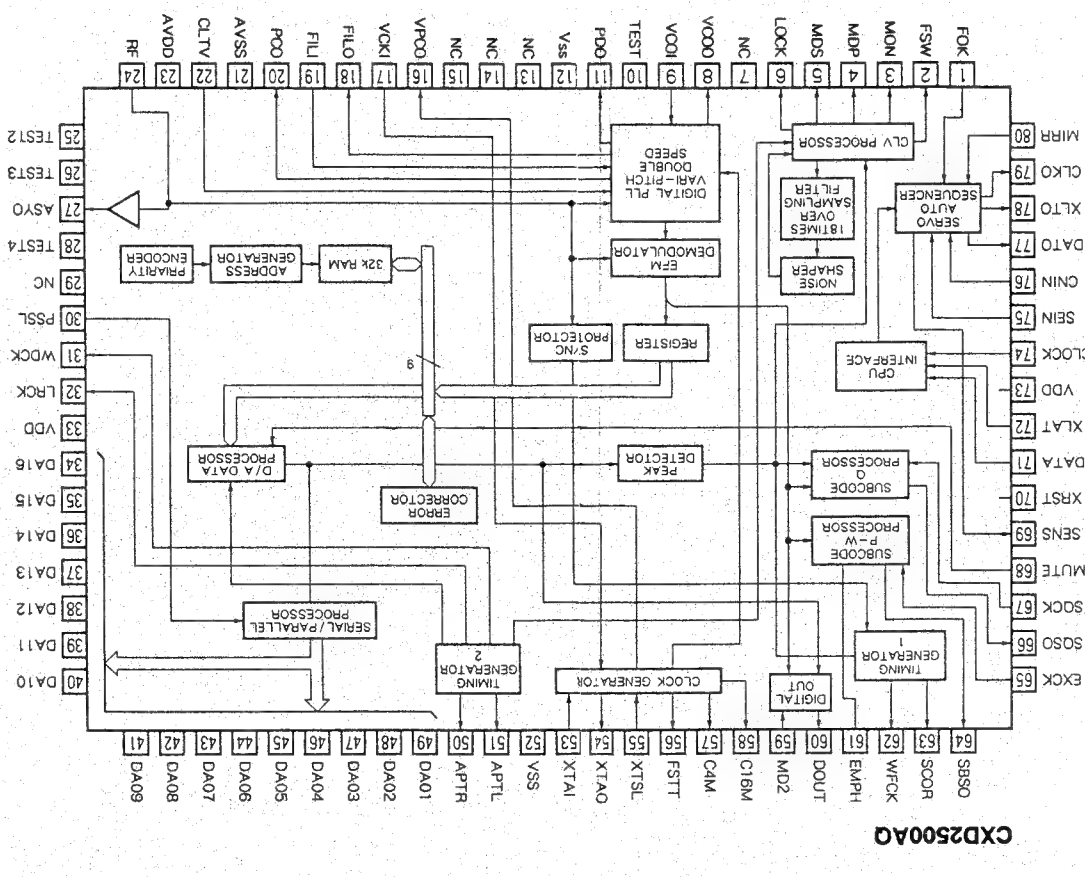
㉕



● IC BLOCK DIAGRAMS



CXA1471S



CXD2500AQ

*1 50T-JUMP: After switching to the pause mode, press the manual search key.
*2 FOCUS-IN: Press the key without loading a disc.

FOCUS-IN (*2) MODE
msec/div
– GND

(7) IC201-Pin 3:TRACK SEARCH MODE (SPDR)
2V/div 50msec/div
– GND

:PLAY MODE
sec/div
– GND

(8) IC202-Pin 9:PLAY MODE (CADR)
1V/div 2sec/div
– GND

:PLAY MODE
1msec/div
– GND

(8) IC202-Pin 9:TRACK SEARCH MODE (CADR)
2V/div 200msec/div
– GND

:50T-JUMP (*1) MODE
1msec/div
– GND

(9) IC151-Pin 32:PLAY MODE (EFM)
2V/div 500nsec/div
– GND

:PLAY MODE
nsec/div
– GND

(10) IC401-Pin 9:PLAY MODE (D/A DATA OUT)
2V/div 0.1 μsec/div
– GND

(16) IC301-Pin 35:PLAY MODE (1kHz) (BCLK)
2V/div 500nsec/div
– GND

(22) IC20-Pin 9:POWER SWITCH-ON (RST)
2V/div 100msec/div
– GND

(26)

(18) IC301-Pin 32:PLAY MODE (1kHz) (LRCK)
2V/div 10 μsec/div
– GND

(22) IC20-Pin 9:POWER SWITCH-OFF (RST)
2V/div 100msec/div
– GND

(27)

(19) IC301-Pin 34:PLAY MODE (1kHz) (DATA)
2V/div 500nsec/div
– GND

(23) :TRACK SEARCH MODE
Upper:TP1-Pin 1 (RF) 1V/div
Lower:IC151-Pin 29 (MIRR)
2V/div 200 μsec/div
– GND
– GND

(28)

(20)

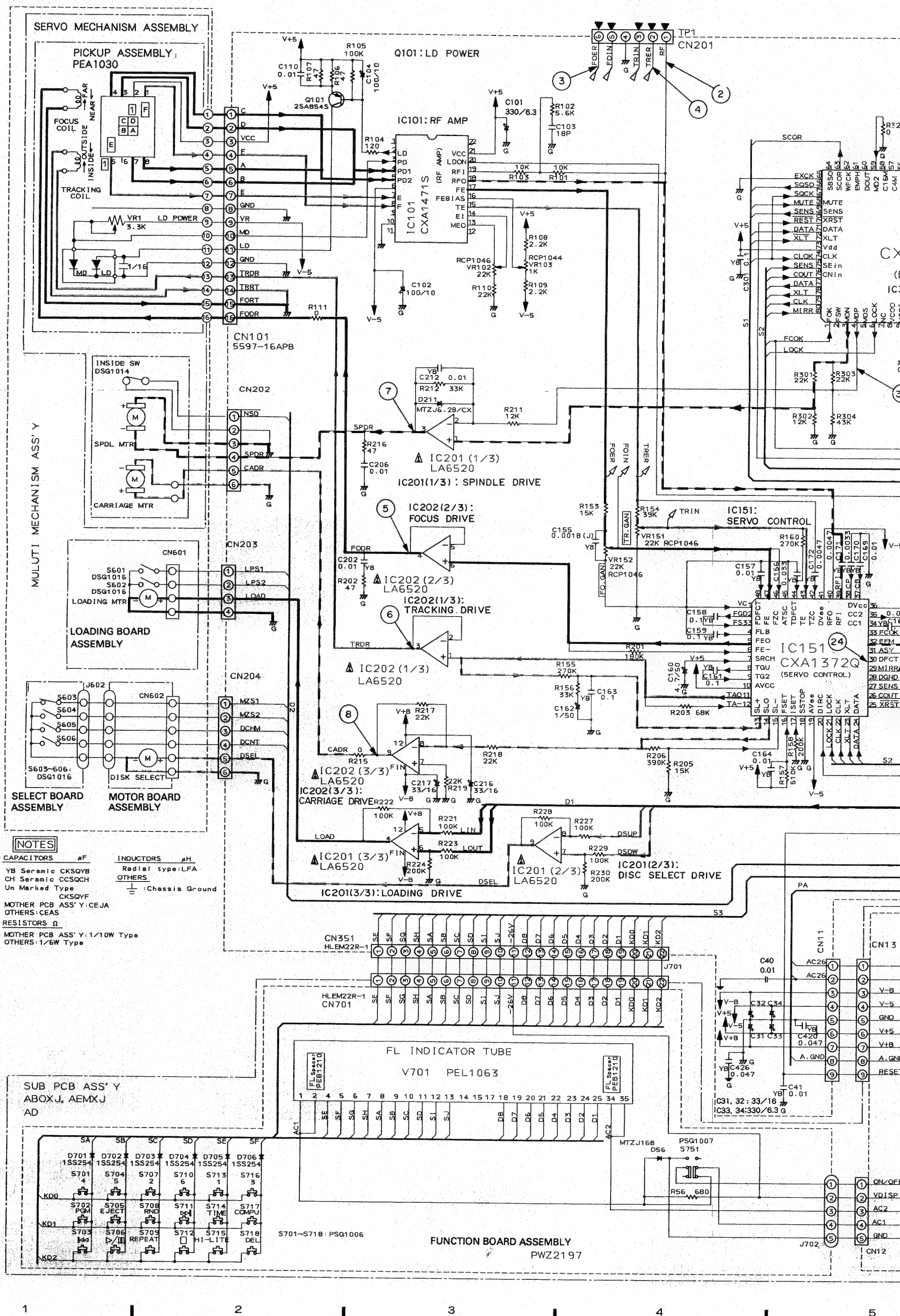
(24) :PLAY MODE
Upper:TP1-Pin 1 (RF) 1V/div
Lower:IC151-Pin 30 (DFCT)
5V/div 200 μsec/div
– GND
– GND

(33) IC301-Pin 4:PLAY MODE (MDP)
2V/div 2 μsec/div
– GND

(21) CN381-Pin1:PLAY MODE (1kHz) (L ch OUTPUT)
1V/div 200 μsec/div
– GND

(25)

(53) IC301-Pin 20:PLAY MODE (PCO)
2V/div 10 μsec/div
– GND



NOTES

CAPACITORS μF

YB Seramic CKSQYB
CH Seramic CCSQCH
Un Marked Type CKSQYF
MOTHER PCB ASS'Y : CEJA
OTHERS : CEAS

INDUCTORS μH

Radial type : LFA

OTHERS

⏚ : Chassis Ground

RESISTORS Ω

MOTHER PCB ASS'Y : 1/10W Type
OTHERS : 1/6W Type

▶ :Measu
:Focus
:Signal
:Tracki
:Carria
:Disc s
:Loadin
:Spindl

TP1
CN201
FOER FOIN TRIN TRER RF

⚠ MOTHER BOARD ASSEMBLY
PWM1640

IC301
CXD2500AQ
(DECODER)
IC301: DECODER

IC401:
D/A CONVERTER
& DIGITAL FILTER
IC401
TC9237BF
X401 PSS1008

IC151:
SERVO CONTROL
IC151
CXA1372Q
(5SERVO CONTROL)

IC351
PD4377
(SYSTEM CONTROL)
IC351: SYSTEM CONTROL

IC201(2/3):
DISC SELECT DRIVE

Q406:
INVERTER BUFFER
Q406 DTA124ES
Q405 DTC124ES
Q405:MUTE DRIV

Q381: BUFFER
Q381 2SC1740S (R/S)
Q382 2SC1740S (R/S)
Q382:
BUFFER
D381–D383: 1SS133X

Q361: BUFFER
2SC1740S
Q361

TEST MODE
S351
PS31006

⚠ POWER SUPPLY BOARD ASSEMBLY

IC20: SYSTEM RESET
& ± 5V REGULATOR
IC20 M5298P

IC21:
-27V REGULATOR
IC21
M5293L

Q63,64:
-27V REGULATOR ON/OFF
Q63 DTA124ES
Q64 2SA933S

⚠ TRANSFORMER BOAR
ASSEMBLY

J701
J702
CN11
CN12
CN13
CN14
J14
PTT123

FL Spacer
PEB1210

MTZJ16B
D56
PSG1007
S751

IC31. 32 : 33/16
IC33. 34:330/6.3

▶ :Measurement point
:Focus servo loop
:Signal route
:Tracking servo loop
:Carriage servo loop
:Disc select motor route
:Loading motor route
:Spindle motor route

⚠ MOTHER BOARD ASSEMBLY
PWM1640

IC401: D/A CONVERTER & DIGITAL FILTER
IC401 TC9237BF

IC351 PD4377 (SYSTEM CONTROL)
IC351: SYSTEM CONTROL

Q403,404: MUTE
Q405: MUTE DRIVER
Q406: INVERTER BUFFER
Q361: BUFFER
Q381: BUFFER
Q382: BUFFER
D381–D383: 1SS133X

CONNECTOR BOARD ASSEMBLY
Connect to Prescribed components.

⚠ POWER SUPPLY BOARD ASSEMBLY
IC20: SYSTEM RESET & ± 5V REGULATOR
IC21: -27V REGULATOR
Q63,64: -27V REGULATOR ON/OFF

⚠ TRANSFORMER BOARD ASSEMBLY
PTT1239

1. RESISTORS:
Indicated in Ω , 1/4W, 1/6W, 1/8W and 1/10W, ± 5% tolerance unless otherwise noted k ; kΩ , M ; MΩ , (F) ; ± 1%, (G) ; ± 2%, (K) ; ± 10%, (M) ; ± 20% tolerance.

2. CAPACITORS:
Indicated in capacity (μF) /voltage (V) unless otherwise noted p ; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
[ ] ;DC voltage (V) at play state.
⇦mA ;DC current at play state.
;Value in ( ) is DC current at stop state.

4. OTHERS:
➡ ; Signal route.
⊘ ; Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES:(The underlined indicates the switch position)
DISPLAY BOARD ASSEMBLY
S701 : 4
S702 : PROGRAM
S703 : SEARCH (◁◁/▮◁◁)
S704 : 5
S705 : EJECT (⏏)
S706 : PLAY/PAUSE (▷/▯▯)
S707 : 2
S708 : RANDOM PLAY
S709 : REPEAT
S710 : 6
S711 : SEARCH (▷▷/ ▷▷▮)
S712 : STOP (□)
S713 : 1
S714 : TIME
S715 : HILITE SCAN
S716 : 3
S717 : COMPU PGM
S718 : DELETE
S751 : POWER

LOADING BOARD ASSEMBLY
S601: LPS1 LOADING POSITION
S602: LPS2

SELECT BOARD ASSEMBLY
S603: MZS1 MAGAZINE
S604: MZS2
S605: DCHM DISC POSITION
S606: DCNT

● Terminal Voltages

IC151
(CXA1372Q)

Pin No.	Voltage	Pin No.	Voltage
1	0	25	5
2	0	26	0
3	0	27	5
4	0	28	0
5	0.2	29	0
6	0	30	N.C.
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5
10	5	34	-1.5
11	0	35	-1.7
12	0	36	5
13	0	37	-0.7
14	0.2-0.8	38	-1.6
15	0	39	0
16	-4	40	0.8
17	1.3	41	-5
18	0	42	0
19	-5	43	0
20	5	44	0
21	5	45	0
22	5	46	0
23	5	47	0
24	5	48	0

IC20
(M5298P)

Pin No.	Voltage	Pin No.	Voltage
1	-8.7	9	5
2	N. C.	10	N. C.
3	-5	11	0.6
4	0.2	12	5
5	-8.7	13	8.2
6	-6.9	14	5
7	N. C.	15	1.2
8	N. C.	16	8.2

IC301
(CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage
1	5	41	N. C.
2	N. C.	42	5
3	5	43	N. C.
4	2.6	44	N. C.
5	N. C.	45	N. C.
6	5	46	4.4
7	N. C.	47	0
8	N. C.	48	0
9	0	49	0 - 0.3
10	0	50	N. C.
11	N. C.	51	N. C.
12	0	52	0
13	N. C.	53	2.5
14	N. C.	54	N. C.
15	N. C.	55	0
16	N. C.	56	N. C.
17	0	57	N. C.
18	2.5	58	N. C.
19	2.4	59	0
20	2.4	60	N. C.
21	0	61	N. C.
22	2.5	62	N. C.
23	5	63	0
24	2.5	64	N. C.
25	N. C.	65	0
26	0	66	3.3 -4.6
27	2.5	67	5
28	0	68	0
29	N. C.	69	2.1 -3
30	0	70	5
31	N. C.	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	5
36	N. C.	76	0
37	N. C.	77	5
38	N. C.	78	5
39	N. C.	79	5
40	N. C.	80	0

IC351
(PD4377A)

Pin No.	Voltage	Pin No.	Voltage
1	5	33	5
2	-23	34	3.8
3	-23	35	4.8
4	-23	36	0
5	-23	37	5
6	-23	38	1.2
7	-23	39	0
8	-23	40	5
9	-23	41	N. C.
10	N. C.	42	0
11	N. C.	43	5
12	0	44	0
13	0	45	5
14	0	46	0
15	0	47	0
16	0.5	48	0
17	1.9	49	0
18	-27	50	0
19	-5	51	0
20	0.8	52	0
21	0.4	53	5
22	-8	54	5
23	1.0	55	5
24	-4	56	2.2
25	0	57	2.2
26	5	58	0
27	0	59	0
28	0	60	N. C.
29	0	61	0
30	-8	62	0
31	5	63	4.8
32	5	64	0

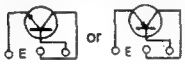
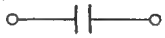
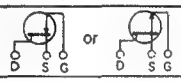
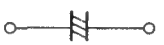
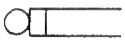
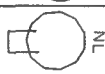
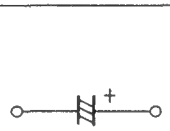
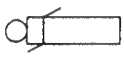
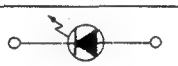
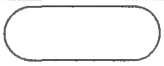
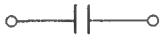
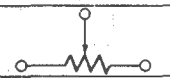
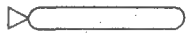
IC101
(CXA1471S)

Pin No.	Voltage	Pin No.	Voltage
1	N. C.	12	N. C.
2	2.9	13	-0.9
3	-4.7	14	-0.7
4	0	15	0
5	0	16	0
6	-5	17	0
7	0	18	0.8
8	0	19	0
9	N. C.	20	5
10	0	21	5
11	N. C.	22	N. C.

IC401
(TC9237BF)

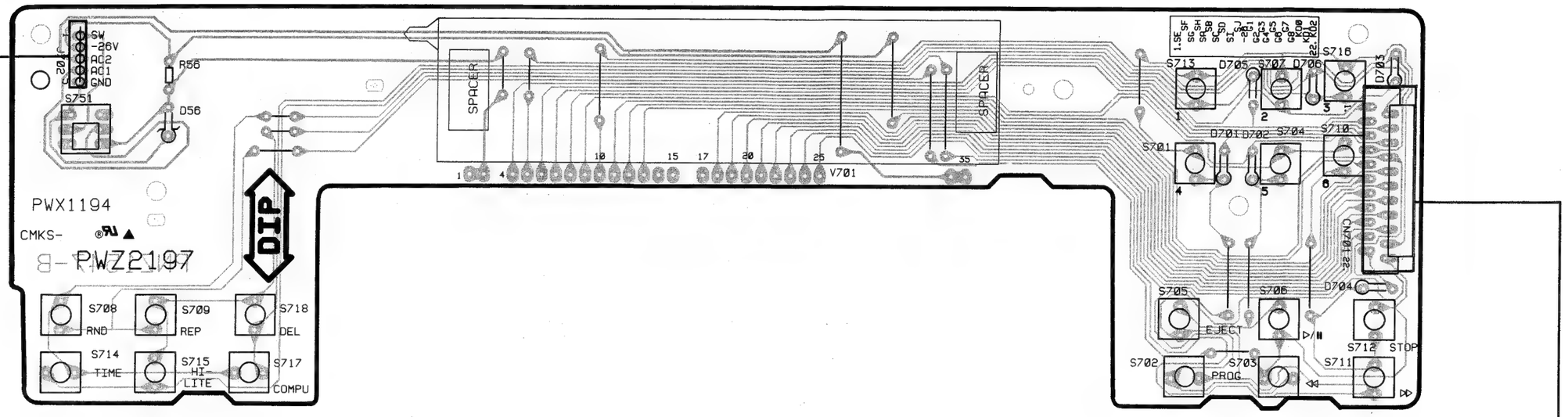
Pin No.	Voltage	Pin No.	Voltage
1	5	15	0
2	0	16	1.9
3	5	17	1.9
4	5.5	18	5
5	2.5	19	2
6	2.5	20	0
7	0	21	0
8	0	22	0
9	2.5	23	0
10	2.5	24	5
11	5	25	2.5
12	0	26	2.5
13	N. C.	27	2.5
14	0	28	5

6. P.C.BOARDS CONNECTION DIAGRAM

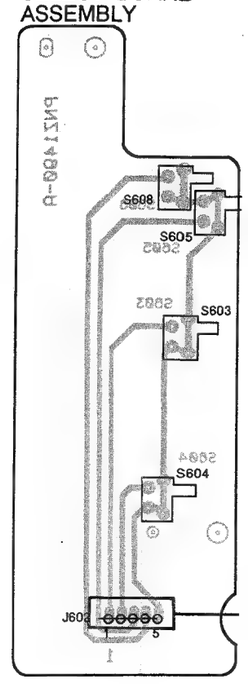
P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
		Diode			Styrol capacitor
					Electrolytic capacitor (Non polarized)
					Electrolytic capacitor (Noiseless)
		Zenner diode			Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
		LED			Power capacitor
		Varactor			Semi-fixed resistor
		Tact switch			Resistor array
					Resistor
		Inductor			
					
		Coil			Resonator
		Transformer			Thermistor
		Filter			

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

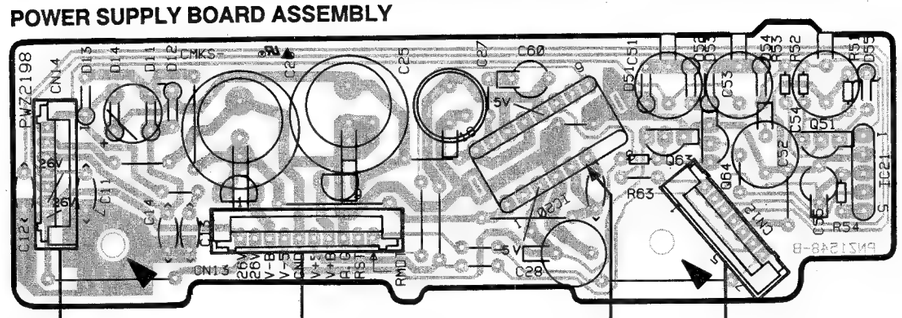
FUNCTION BOARD ASSEMBLY (PWZ2197)



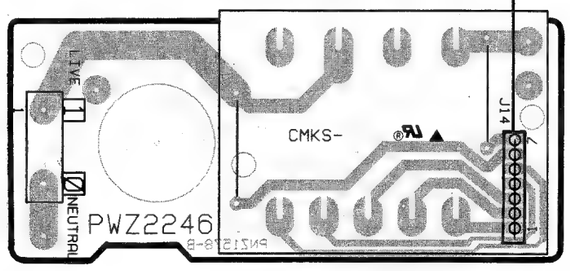
SELECT BOARD ASSEMBLY



POWER SUPPLY BOARD ASSEMBLY



TRANSFORMER BOARD ASSEMBLY



IC20
(M5298P)

Pin No.	Voltage	Pin No.	Voltage
1	-8.7	9	5
2	N. C.	10	N. C.
3	-5	11	0.6
4	0.2	12	5
5	-8.7	13	8.2
6	-6.9	14	5
7	N. C.	15	1.2
8	N. C.	16	8.2

IC301
(CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage
1	5	41	N. C.
2	N. C.	42	5
3	5	43	N. C.
4	2.6	44	N. C.
5	N. C.	45	N. C.
6	5	46	4.4
7	N. C.	47	0
8	N. C.	48	0
9	0	49	0 - 0.3
10	0	50	N. C.
11	N. C.	51	N. C.
12	0	52	0
13	N. C.	53	2.5
14	N. C.	54	N. C.
15	N. C.	55	0
16	N. C.	56	N. C.
17	0	57	N. C.
18	2.5	58	N. C.
19	2.4	59	0
20	2.4	60	N. C.
21	0	61	N. C.
22	2.5	62	N. C.
23	5	63	0
24	2.5	64	N. C.
25	N. C.	65	0
26	0	66	3.3 -4.6
27	2.5	67	5
28	0	68	0
29	N. C.	69	2.1 -3
30	0	70	5
31	N. C.	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	5
36	N. C.	76	0
37	N. C.	77	5
38	N. C.	78	5
39	N. C.	79	5
40	N. C.	80	0

IC351
(PD4377A)

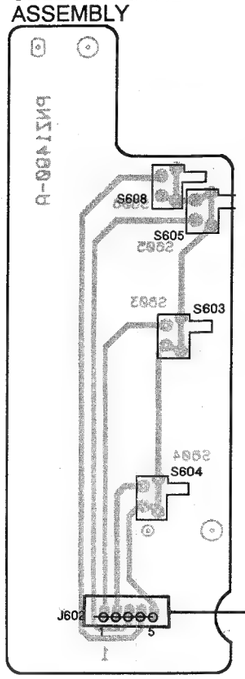
Pin No.	Voltage	Pin No.	Voltage
1	5	33	5
2	-23	34	3.8
3	-23	35	4.8
4	-23	36	0
5	-23	37	5
6	-23	38	1.2
7	-23	39	0
8	-23	40	5
9	-23	41	N. C.
10	N. C.	42	0
11	N. C.	43	5
12	0	44	0
13	0	45	5
14	0	46	0
15	0	47	0
16	0.5	48	0
17	1.9	49	0
18	-27	50	0
19	-5	51	0
20	0.8	52	0
21	0.4	53	5
22	-8	54	5
23	1.0	55	5
24	-4	56	2.2
25	0	57	2.2
26	5	58	0
27	0	59	0
28	0	60	N. C.
29	0	61	0
30	-8	62	0
31	5	63	4.8
32	5	64	0

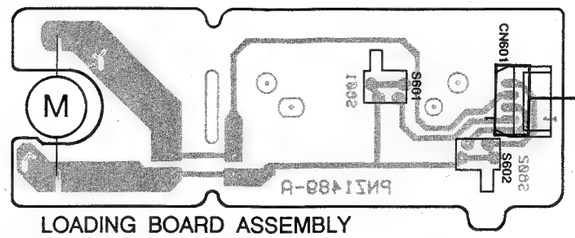
IC401
(TC9237BF)

Pin No.	Voltage	Pin No.	Voltage
1	5	15	0
2	0	16	1.9
3	5	17	1.9
4	5.5	18	5
5	2.5	19	2
6	2.5	20	0
7	0	21	0
8	0	22	0
9	2.5	23	0
10	2.5	24	5
11	5	25	2.5
12	0	26	2.5
13	N. C.	27	2.5
14	0	28	5

This P.C.B. connection diagram is viewed from the parts mounted side.

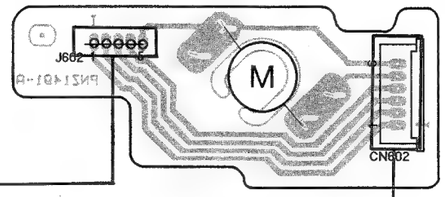
SELECT BOARD ASSEMBLY

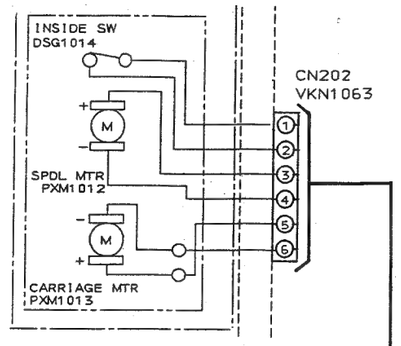




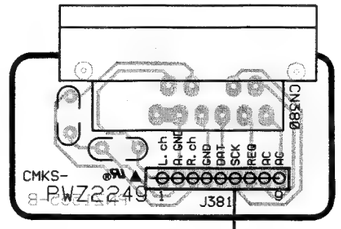
LOADING BOARD ASSEMBLY

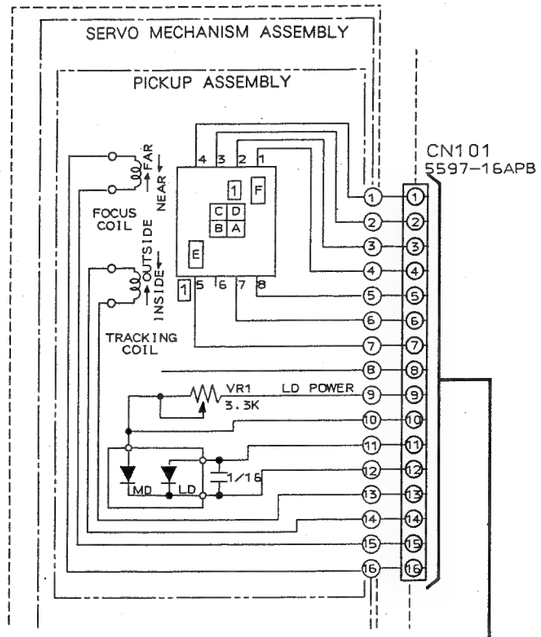
MOTOR BOARD ASSEMBLY





CONNECTOR BOARD ASSEMBLY





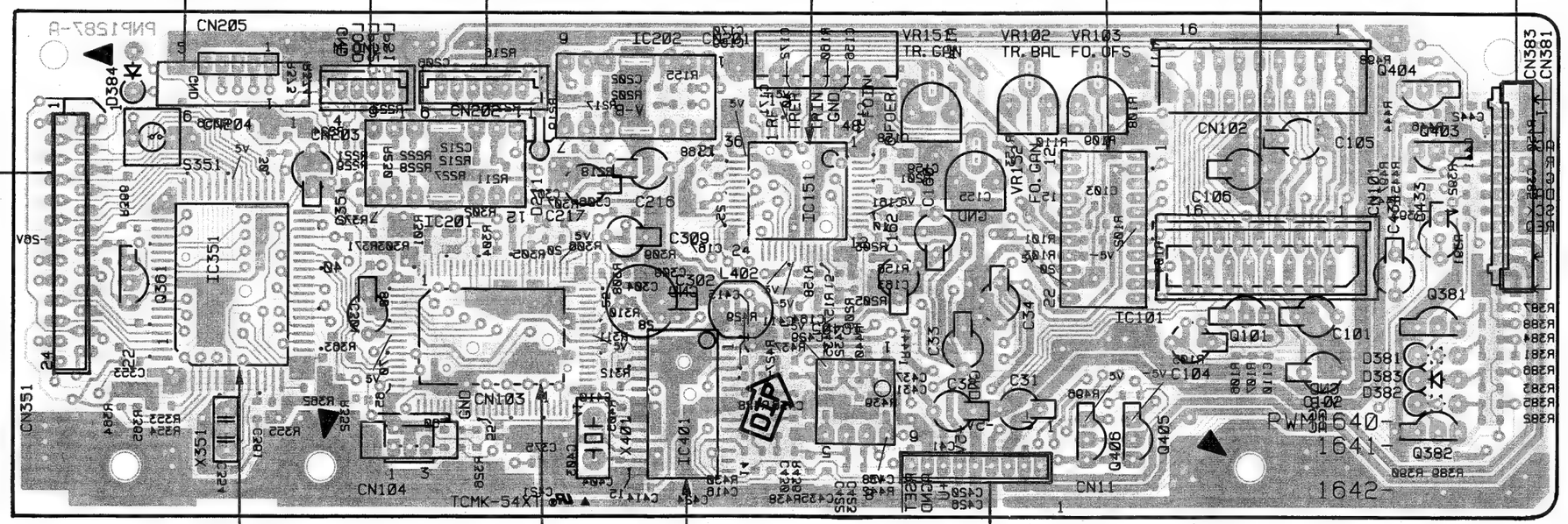
IC151
(CXA1372Q)

Pin No.	Voltage	Pin No.	Voltage
1	0	25	5
2	0	26	0
3	0	27	5
4	0	28	0
5	0.2	29	0
6	0	30	N.C.
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5
10	5	34	-1.5
11	0	35	-1.7
12	0	36	5
13	0	37	-0.7
14	0.2—0.8	38	-1.6
15	0	39	0
16	-4	40	0.8
17	1.3	41	-5
18	0	42	0
19	-5	43	0
20	5	44	0
21	5	45	0
22	5	46	0
23	5	47	0
24	5	48	0

IC101
(CXA1471S)

Pin No.	Voltage	Pin No.	Voltage
1	N. C.	12	N. C.
2	2.9	13	-0.9
3	-4.7	14	-0.7
4	0	15	0
5	0	16	0
6	-5	17	0
7	0	18	0.8
8	0	19	0
9	N. C.	20	5
10	0	21	5
11	N. C.	22	N. C.

MOTHER BOARD ASSEMBLY (PWM1640)



IC401
(TC9237BF)

Pin No.	Voltage	Pin No.	Voltage
1	5	15	0
2	0	16	1.9
3	5	17	1.9
4	5.5	18	5
5	2.5	19	2
6	2.5	20	0
7	0	21	0
8	0	22	0
9	2.5	23	0
10	2.5	24	5
11	5	25	2.5
12	0	26	2.5
13	N. C.	27	2.5
14	0	28	5

VR151 VR102 VR103
VR152

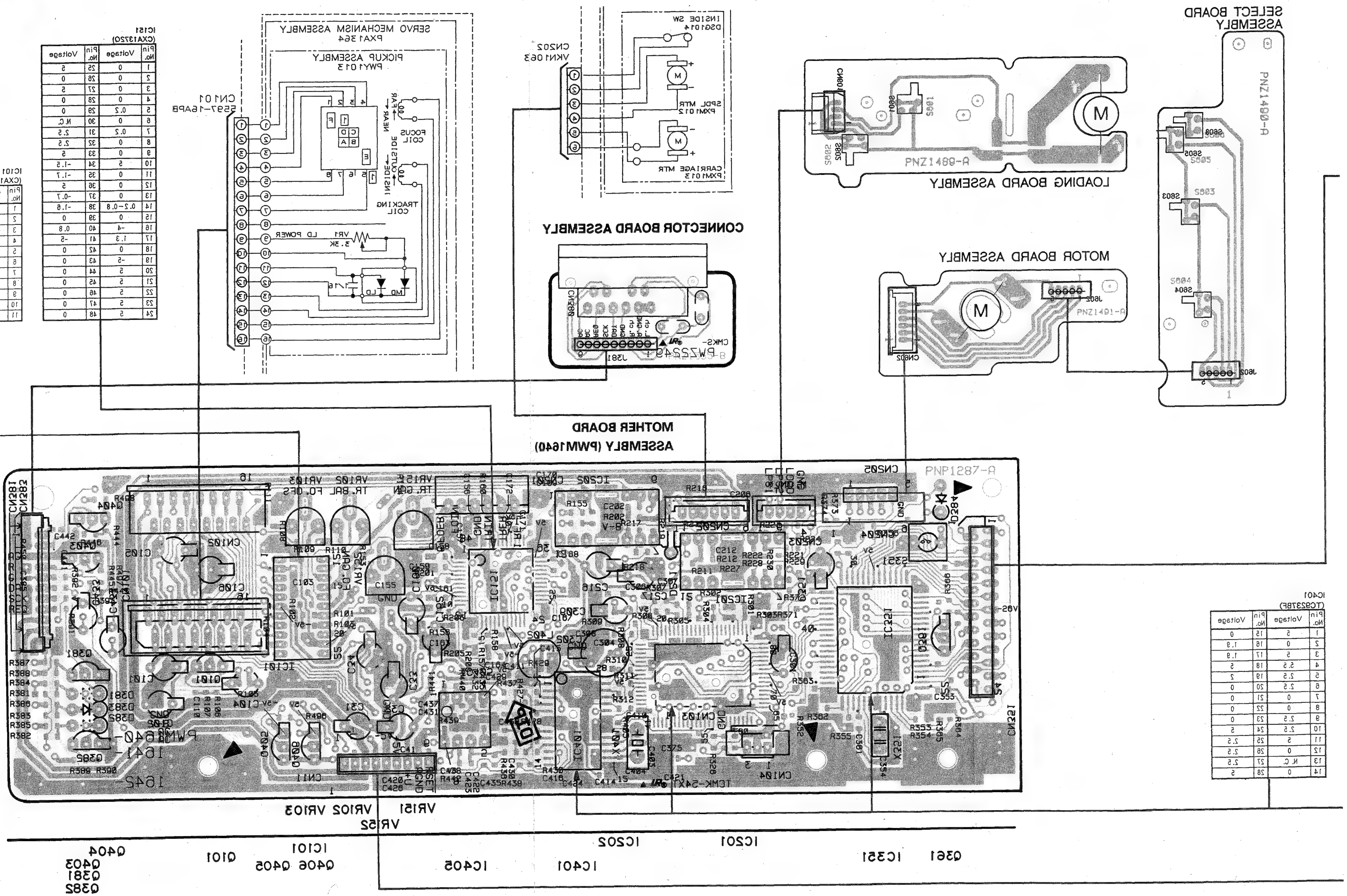
IC201 IC202
Q361 IC351 IC401 IC405
IC101 Q101 Q404
Q406 Q405 Q403
Q381
Q382

IC101
(CXA1471S)

Pin No.	Voltage	Pin No.	Voltage
1	N. C.	12	N. C.
2	2.9	13	-0.9
3	-4.7	14	-0.7
4	0	15	0
5	0	16	0
6	-5	17	0
7	0	18	0.8
8	0	19	0
9	N. C.	20	5
10	0	21	5
11	N. C.	22	N. C.

IC151
(CXA1372Q)

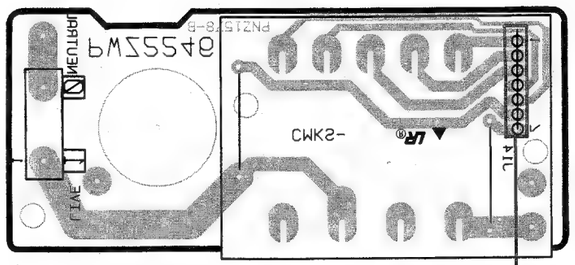
Pin No.	Voltage	Pin No.	Voltage
1	0	25	5
2	0	26	0
3	0	27	5
4	0	28	0
5	0.2	29	0
6	0	30	N.C.
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5
10	5	34	-1.5
11	0	35	-1.7
12	0	36	5
13	0	37	-0.7
14	0.2−0.8	38	-1.6
15	0	39	0
16	-4	40	0.8
17	1.3	41	-5
18	0	42	0
19	-5	43	0
20	5	44	0
21	5	45	0
22	5	46	0
23	5	47	0
24	5	48	0



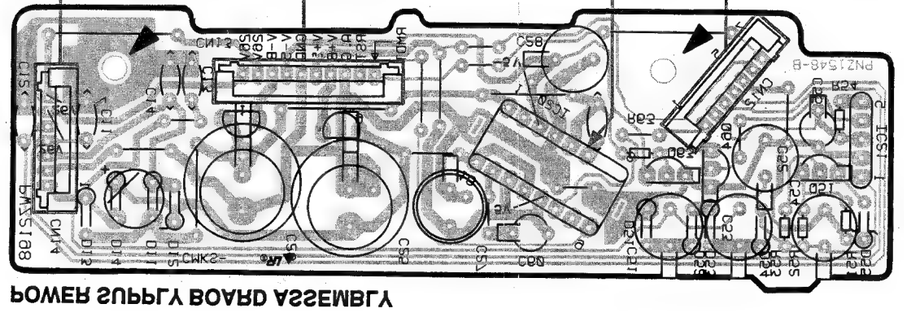
IC401
(TC9237BF)

Pin No.	Voltage	Pin No.	Voltage
1	5	15	0
2	0	16	1.9
3	5	17	1.9
4	5.5	18	5
5	2.5	19	2
6	2.5	20	0
7	0	21	0
8	0	22	0
9	2.5	23	0
10	2.5	24	5
11	5	25	2.5
12	0	26	2.5
13	N. C.	27	2.5
14	0	28	5

This P. C. B. connection diagram is viewed from the foil side.



TRANSFORMER BOARD ASSEMBLY



POWER SUPPLY BOARD ASSEMBLY

No.	Voltage	No.	Voltage
1	-8.1	8	5
2	0	9	-5
3	N.C.	10	N.C.
4	-8.1	11	8.0
5	8.1	12	-5
6	0	13	5
7	N.C.	14	5.8
8	N.C.	15	5.8

IC50 (M5S98)

No.	Voltage	No.	Voltage
1	0	81	5
2	5.2	82	0
3	0	83	0
4	5.2	84	N.C.
5	0	85	0
6	5.2	86	0
7	0	87	5
8	N.C.	88	0
9	0	89	0
10	0	90	N.C.
11	N.C.	91	0
12	N.C.	92	N.C.
13	N.C.	93	5.2
14	N.C.	94	N.C.
15	0	95	0
16	N.C.	96	N.C.
17	N.C.	97	0
18	0	98	0
19	N.C.	99	0
20	0	100	0
21	N.C.	101	0
22	N.C.	102	0
23	N.C.	103	0
24	N.C.	104	N.C.
25	0	105	0
26	N.C.	106	0
27	N.C.	107	0
28	N.C.	108	0
29	N.C.	109	0
30	N.C.	110	0
31	N.C.	111	0
32	N.C.	112	0
33	N.C.	113	0
34	N.C.	114	0
35	N.C.	115	0
36	N.C.	116	0
37	N.C.	117	0
38	N.C.	118	0
39	N.C.	119	0
40	N.C.	120	0

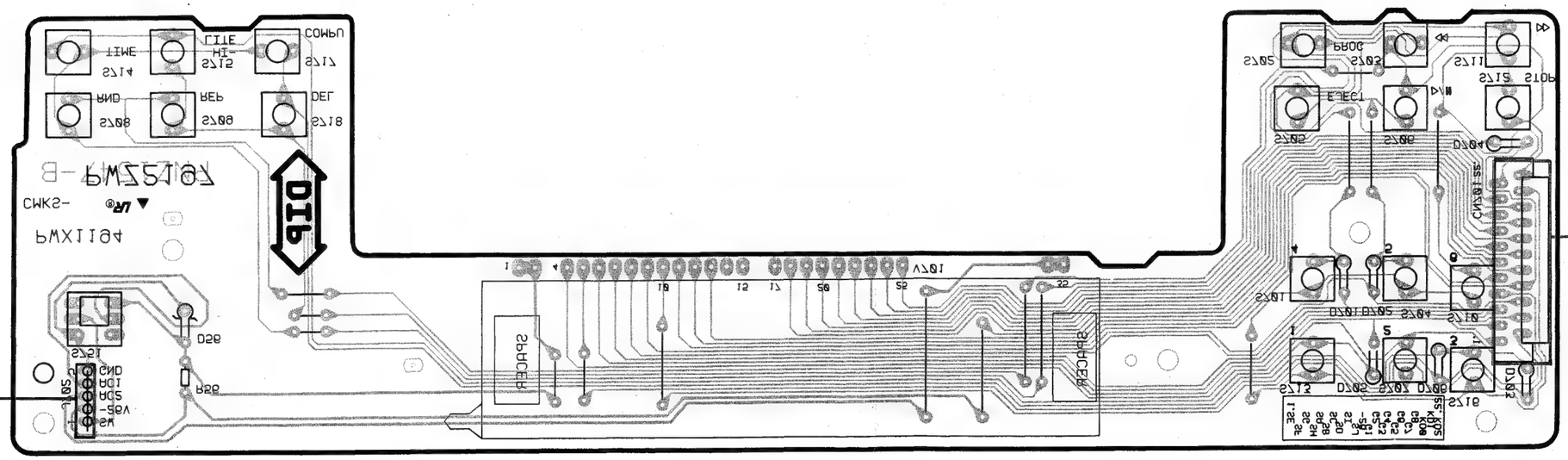
IC301 (CXD5200AQ)

No.	Voltage	No.	Voltage
1	0	81	5
2	0	82	0
3	0	83	0
4	N.C.	84	0
5	0	85	0
6	0	86	0
7	0	87	0
8	0	88	0
9	0	89	0
10	0	90	0
11	0	91	0
12	0	92	0
13	0	93	0
14	0	94	0
15	0	95	0
16	0	96	0
17	0	97	0
18	0	98	0
19	0	99	0
20	0	100	0

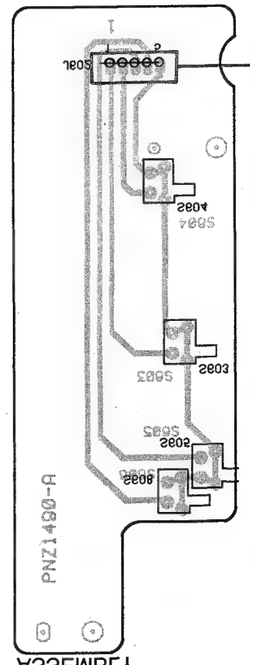
IC321 (CXD3177A)

No.	Voltage	No.	Voltage
1	0	81	5
2	0	82	0
3	0	83	0
4	0	84	0
5	0	85	0
6	0	86	0
7	0	87	0
8	0	88	0
9	0	89	0
10	0	90	0
11	0	91	0
12	0	92	0
13	0	93	0
14	0	94	0
15	0	95	0
16	0	96	0
17	0	97	0
18	0	98	0
19	0	99	0
20	0	100	0

IC401 (TC9273BF)



FUNCTION BOARD ASSEMBLY (PWZ2787)



SELECT BOARD ASSEMBLY

7. PCB PARTS LIST

NOTES:

- *Part without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω → 56 × 10¹ → 561 ..... RD1/8PM 5 6 1 J
47kΩ → 47 × 10³ → 473 ..... RD1/4PS 4 7 3 J
0.5Ω → 0R5 ..... RN2H 0 R 5 K
1Ω → 010 ..... RS1P 0 1 0 K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ → 562 × 10¹ → 561 ..... RN1/4SR 5 6 2 1 F

Mark	No.	Description	Part No.
LIST OF ASSEMBLIES			
◉		MOTHER BOARD ASSEMBLY	PWM1640
◉		FUNCTION BOARD ASSEMBLY	PWZ2197
		POWER SUPPLY BOARD ASSEMBLY	
		TRANSFORMER BOARD ASSEMBLY	
		CONNECTOR BOARD ASSEMBLY	
		LOADING BOARD ASSEMBLY	
		SELECT BOARD ASSEMBLY	
		MOTOR BOARD ASSEMBLY	
◉ MOTHER BOARD ASSEMBLY (PWM1640)			
SEMICONDUCTORS			
	IC101	PRE AMP IC	CXA1471S
	IC151	SERVO IC	CXA1372Q
⚠	IC201, 202	POWER OP-AMP,IC	LA6520
	IC301	EFM DEMODULATION IC	CXD2500AQ
	IC351	MICROCOMPUTER,IC	PD4377A
	IC401	8FS DF DA CONVERTER	TC9237BF
	IC405	OP-AMP IC	NJM4558D
	Q101	TRANSISTOR	2SA854S
	Q361	TRANSISTOR	2SC1740S
	Q381, 382	TRANSISTOR	2SC1740S
	Q403, 404	TRANSISTOR	2SD2144S
	Q405	TRANSISTOR	DTC124ES
	Q406	TRANSISTOR	DTA124ES
	D211	ZENNER DIODE	MTZJ6.2BX
	D381 – 383	DIODE	1SS133X
SWITCH			
	S351	TACT SWITCH (TEST)	PSG1006
COIL			
	L402	RADIAL INDUCTOR	LFA010K
CAPACITORS			
	C31, 32	ELECTROLYTIC CAPACITOR	CEJA330M16
	C33, 34	ELECTROLYTIC CAPACITOR	CEJA331M6R3
	C40	CERAMIC CAPACITOR	CKCYF103Z50
	C41	CERAMIC CAPACITOR	CKSQYB103K50
	C101	ELECTROLYTIC CAPACITOR	CEJA331M6R3
	C102	ELECTROLYTIC CAPACITOR	CEJA101M10
	C103	CHIP CAPACITOR	CCSQCH180J50
	C104	ELECTROLYTIC CAPACITOR	CEJA101M10
	C110	CHIP CAPACITOR	CKSQYF103Z50
	C155	CERAMIC CAPACITOR	CKSQYB182K50
	C156	CERAMIC CAPACITOR	CKSQYB333K25
	C157	CERAMIC CAPACITOR	CKSQYB103K50
	C158, 159	CHIP CAPACITOR	CKSQYB104K25
	C160	ELECTROLYTIC CAPACITOR	CEJA4R7M50
	C161	CHIP CAPACITOR	CKSQYB104K25
	C162	ELECTR.CAPACITOR	CEJA010M50
	C163	CHIP CAPACITOR	CKSQYB104K25
	C164	CERAMIC CAPACITOR	CKSQYB103K50
	C167	CERAMIC CAPACITOR	CKSQYB103K50
	C168	CERAMIC CAPACITOR	CKSQYB333K25
	C169	CERAMIC CAPACITOR	CKSQYB103K50
	C170	CERAMIC CAPACITOR	CKSQYB332K50
	C171, 172	CERAMIC CAPACITOR	CKSQYB472K50
	C202	CERAMIC CAPACITOR	CKSQYB103K50
	C206	CERAMIC CAPACITOR	CKSQYB103K50
	C212	CERAMIC CAPACITOR	CKSQYB103K50
	C216, 217	ELECTROLYTIC CAPACITOR	CEJA330M16
	C301	CHIP CAPACITOR	CKSQYB104K25
	C302	ELECTROLYTIC CAPACITOR	CEJA330M16
	C304	CHIP CAPACITOR	CKSQYB104K25
	C306	CERAMIC CAPACITOR	CKSQYB152K50
	C307	CHIP CAPACITOR	CKSQYB473K25
	C308	CERAMIC CAPACITOR	CKSQYB103K50
	C309	ELECTROLYTIC CAPACITOR	CEJAR47M50
	C351	ELECTROLYTIC CAPACITOR	CEJA330M16
	C353	CHIP CAPACITOR	CKSQYF103Z50
	C354	CERAMIC CAPACITOR	CKSQYB103K50
	C361	CHIP CAPACITOR	CKSQYF103Z50
	C375	CERAMIC CAPACITOR	CKSQYB103K50
	C385	CHIP CAPACITOR	CKSQYB104K25
	C403, 404	CERAMIC CAPACITOR	CCSQCH470J50
	C410, 411	CHIP CAPACITOR	CKSQYB104K25
	C414 – 416	CHIP CAPACITOR	CKSQYB104K25
	C420, 421	CHIP CAPACITOR	CKSQYB473K25
	C422, 423	CHIP CAPACITOR	CKSQYB104K25
	C424	CHIP CAPACITOR	CKSQYB473K25
	C426	CHIP CAPACITOR	CKSQYB473K25
	C429, 430	CERAMIC CAPACITOR	CCSQCH560J50

Mark	No.	Description	Part No.
	C431, 432	CHIP CAPACITOR	CKSQYB104K25
	C433, 434	ELECTROLYTIC CAPACITOR	CEJA220M25
	C435 – 438	CERAMIC CAPACITOR	CCSQCH390J50
	C441, 442	CERAMIC CAPACITOR	CKSQYB152K50
RESISTORS			
	VR102	VR (22 kΩ)	RCP1046
	VR103	VR (1 kΩ)	RCP1044
	VR151, 152	VR (22 kΩ)	RCP1046
		OTHER RESISTORS	RS1/10S□□□J
OTHERS			
	X351	CERAMIC RESONATOR	VSS1014
	X401	XTAL RES (OSC)	PSS1008
	CN101	CONNECTOR	5597-16APB
	CN351	CONNECTOR	HLEM22R-1

LOADING BOARD ASSEMBLY

SWITCHES

	S601, 602	PUSH SWITCH (LOADING POSITION)	DSG1016

SELECT BOARD ASSEMBLY

SWITCHES

	S603 – 606	PUSH SWITCH (MAGAZINE, DISC POSITION)	DSG1016

◉ FUNCTION BOARD ASSEMBLY (PWZ2197)

SEMICONDUCTORS

	D56	ZENNER DIODE	MTZJ16B
	D701 – 706	DIODE	1SS254

SWITCHES

	S701 – 718	TACT SWITCH (DELETE, REPEAT, RANDOM PLAY, COMPU PGM, PLAY, SEARCH, TIME, HI-LITE SCAN, PROGRAM, PAUSE, STOP, EJECT, DISC NUMBER(1 — 6))	PSG1006
	S751	PUSH SWITCH (POWER)	PSG1007

RESISTOR

	R56	CARBON FILM RESISTOR	RD1/6PM681J

OTHERS

	V701	FL INDICATOR TUBE	PEL1063
	CN701	CONNECTOR	HLEM22R-1

POWER SUPPLY BOARD ASSEMBLY

SEMICONDUCTORS

⚠	IC20	REGULATOR IC	M5298P
⚠	IC21	REGULATOR IC	M5293L
	Q63	TRANSISTOR	DTA124ES
	Q64	TRANSISTOR	2SA933S
⚠	D11 – 14	DIODE	11ES2
⚠	D51 – 54	DIODE	11ES2

Mark	No.	Description	Part No.
CAPACITORS			
	C11 – 14	CERAMIC CAPACITOR	CKCYF103Z50
	C25	ELECTR.CAPACITOR	CEAS332M16
	C26	ELECTR.CAPACITOR	CEAS222M16
	C27	ELECTROLYTIC CAPACITOR	CEAS471M6R3
	C28	ELECTR.CAPACITOR	CEAS101M10
	C51, 52	ELECTR.CAPACITOR	CEAS221M25
	C53	ELECTR.CAPACITOR	CEAS101M25
	C54	ELECTR.CAPACITOR	CEAS101M50
	C55	ELECTR.CAPACITOR	CEAS100M50
	C60	ELECTR.CAPACITOR	CEAS010M50
RESISTORS			
		ALL RESISTORS	RD1/6PM□□□J

MOTOR BOARD ASSEMBLY

There is not supplied parts in this assembly.

TRANSFORMER BOARD ASSEMBLY

There is not supplied parts in this assembly.

CONNECTOR BOARD ASSEMBLY

There is not supplied parts in this assembly.

8. ADJUSTMENTS

8.1. Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

● Adjustment Items/Verification Items and Order

Step	Item	Test Point	Adjustment Location
1	Focus offset adjustment	TP1, Pin 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Grating adjustment	TP1, Pin 2 (TRK. ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP1, Pin 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Pickup radial/tangential direction tilt adjustment	TP1, Pin 1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment	TP1, Pin 1 (RF)	VR1 (RF level)
6	Focus servo loop gain adjustment	TP1, Pin 5 (FCS. IN) TP1, Pin 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Tracking servo loop gain adjustment	TP1, Pin 3 (TRK. IN) TP1, Pin 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Focus error signal verification	TP1, Pin 6 (FCS. ERR)	————

● **Abbreviation table**

FCS. ERR :Focus Error
FCS. OFS :Focus Offset
TRK. ERR :Tracking Error
TRK. BAL :Tracking Balance
FCS GAN :Focus Gain
TRK GAN :Tracking Gain
FCS. IN :Focus In
TRK. IN :Tracking In

● Measuring Instruments and Tools

1. Dual trance oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. Low-pass filter (39 kΩ + 0.001 μF)
5. Resistor (100 kΩ)
6. Standard tools

● Test Point and Adjustment Variable Resistor Positions

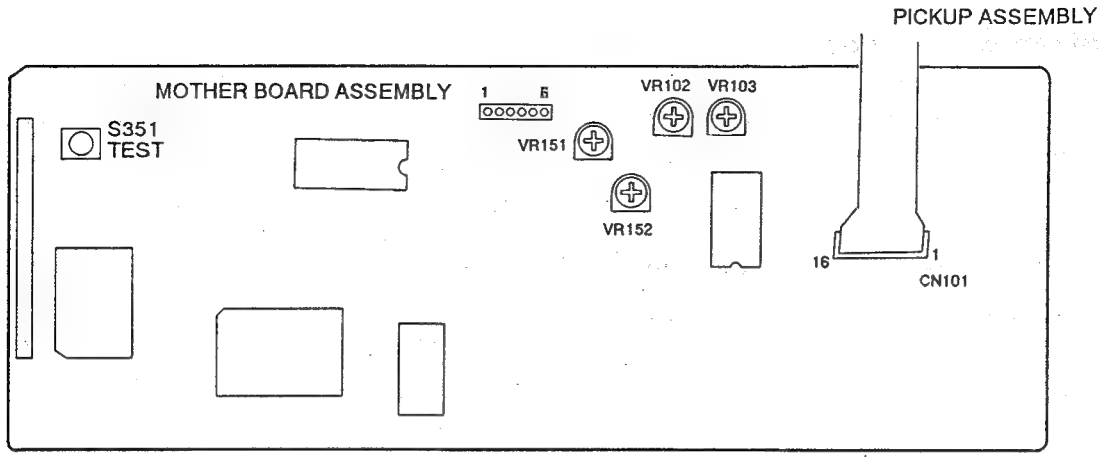


Figure 1 Adjustment Locations

● Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

● Test Mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.
1. Turn off the power switch.
2. Press the TEST mode switch (S351). (See Figure 1.)
3. Turn on the power switch.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1 – 3.

[Release from test mode]

Here is the procedure for releasing the test mode:

1. Press the STOP key and stop all operations.
2. Turn off the power switch on the front panel.

[Operations of the keys in test mode]

Code	Key Name	Function in Test Mode	Explanation
	PROGRAM	Focus servo close	The laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised twice and returned to its original position.
▷ / ▯▯	PLAY/PAUSE	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.
▷ / ▯▯	PLAY/PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.

Code	Key Name	Function in Test Mode	Explanation
⏮ / ◀◀	MANUAL / TRACK SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
▶▶ / ⏭	MANUAL / TRACK SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
□	STOP	Stop	Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed.
⏏	EJECT	CD magazine eject	Stores Disc 1 in the CD magazine, then ejects the CD magazine. However, even though the CD magazine is ejected, the pickup does not return to the park position. Even if the CD magazine is mounted again, the pickup remains where it is.

Note : When inserting the magazine, disc 1 of the magazine is loaded automatically.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.
Here is the key operation sequence for playing back a disc in test mode.

PROGRAM	Lights up the laser diode and closes the focus servo.
⇩	
PLAY/PAUSE ▷ / ▯▯	Starts the spindle motor and closes the spindle servo.
⇩	
PLAY/PAUSE ▷ / ▯▯	Closes the tracking servo.

(Press the "▷ / ▯▯" key twice.)

Wait at least 2-3 seconds between each of these operations.

1. Focus Offset Adjustment

● Objective	Sets the DC offset for the focus error amp.		
● Symptom when out of adjustment	The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS. ERR) [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) VR103 (FCS. OFS) None needed

[Procedure]

Adjust VR103 (FCS. OFS) so that the DC voltage at TP1, Pin 6 (FCS. ERR) is −150 ± 50 mV.

2. Grating Adjustment

● Objective ● Symptom when out of adjustment	To align the tracking error generation laser beam spots to the optimum angle on the track. Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK. ERR) via a low pass filter. (See Figure 2) [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open Pickup grating adjustment slit YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R=35mm) with the MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| or REV |◁◁ / ◁◁ key.
2. Press the PROGRAM key, then the PLAY/PAUSE ▷ / ▯▯ key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver clockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver clockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.
   Reference : Figure 3 shows the relation between the angle of the tracking beam with the track and the waveform.

   Note : The amplitude of the tracking error signal is about 3 Vp-p (when a 39 kΩ + 0.001 μF low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), the objective lens or the pickup malfunction may be the cause. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.
5. Return the pickup to more or less midway across the disc with the MANUAL/TRACK SEARCH REV |◁◁ / ◁◁ key, press the PLAY/PAUSE ▷ / ▯▯ key and double check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, double check the null point and adjust the grating again.

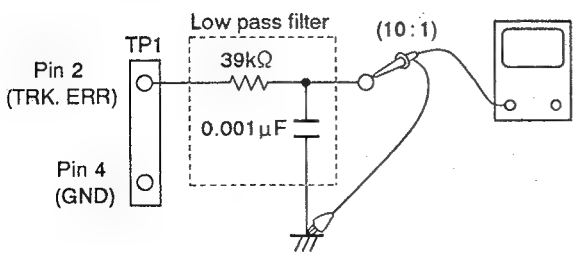
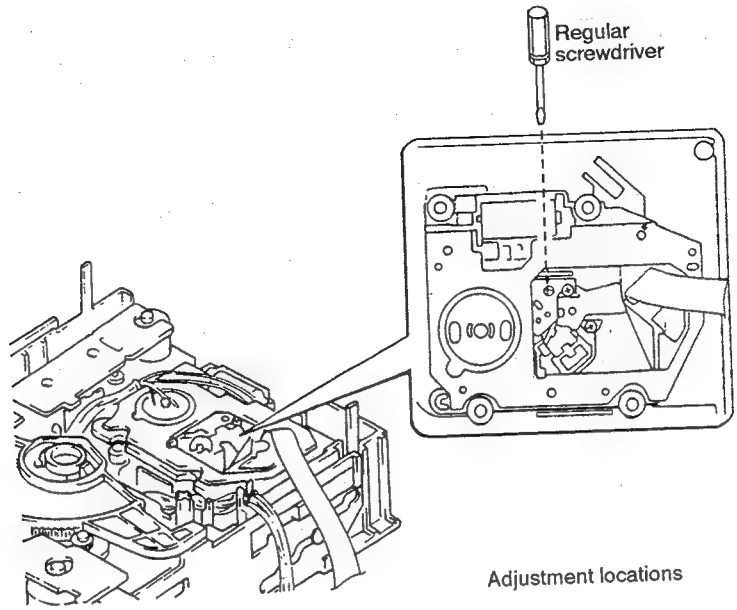


Figure 2



[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1, Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the waveform is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)
This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

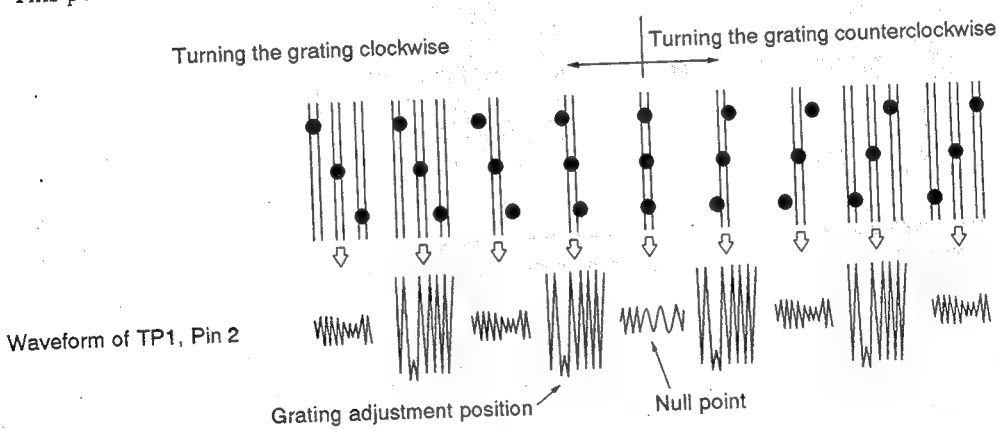
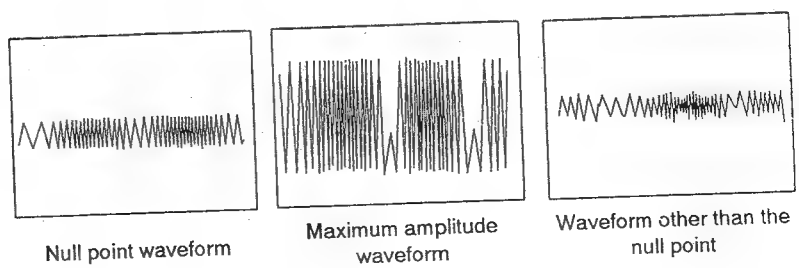


Figure 3

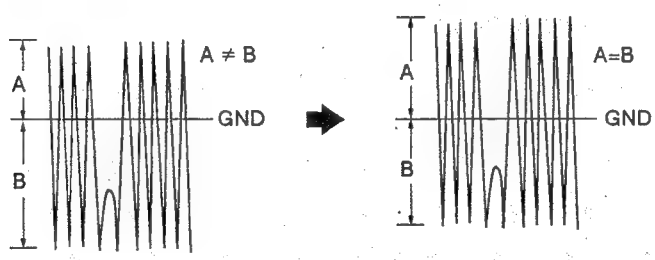


3. Tracking Error Balance Adjustment

● Objective ● Symptom when out of adjustment	To correct for the variation in the sensitivity of the tracking photodiode. Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK. ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open VR102 (TRK. BAL) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R=35 mm) with the MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| or REV |◁◁ / ◁◁ key.
2. Press the PROGRAM key, then the PLAY/PAUSE ▷ / ▯▯ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR102 (TRK. BAL) so that the positive amplitude and negative amplitude of the tracking error signal at TP1, Pin 2 (TRK. ERR) are the same (in other words, so that there is no DC component).



When there is a DC component

When there is no DC component

4. Pickup Radial/Tangential Tilt Adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken;some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play Pickup radial tilt adjustment screw and tangential tilt adjustment screw YEDS-7

[Procedure]

1. Press the MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| or REV |◁◁ / ◁◁ key to move the pickup to halfway across the disc (R=35mm).
   Press the PROGRAM key, the PLAY/PAUSE ▷ / ▯▯ key, then the PLAY/PAUSE ▷ / ▯▯ key in that order to close the focus servo then the spindle servo and put the player into play mode. (Press the " ▷ / ▯▯ " key twice.)
2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

Note:Radial and tangential mean the directions relative to the disc shown in Figure 4.

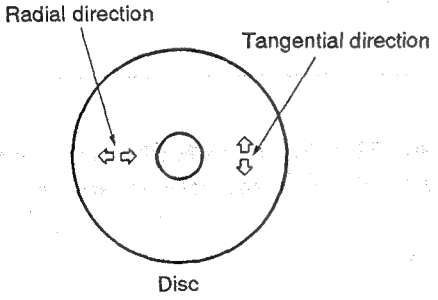
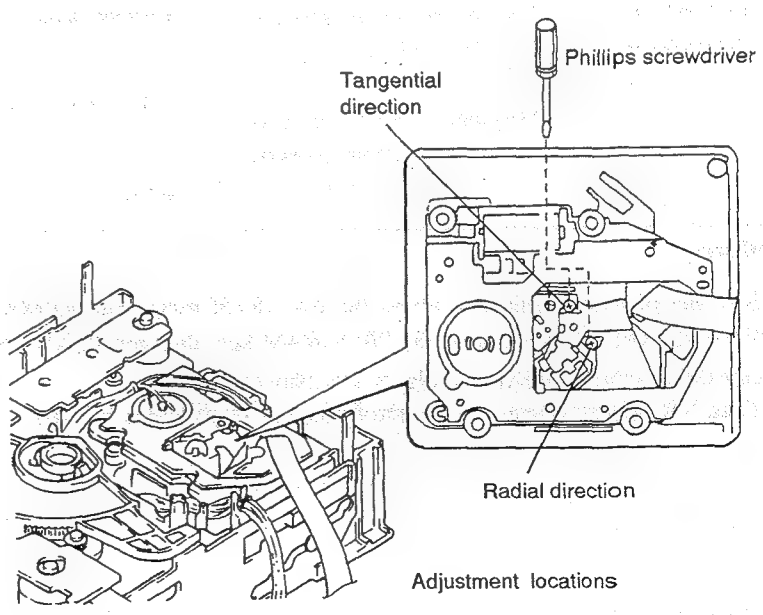


Figure 4



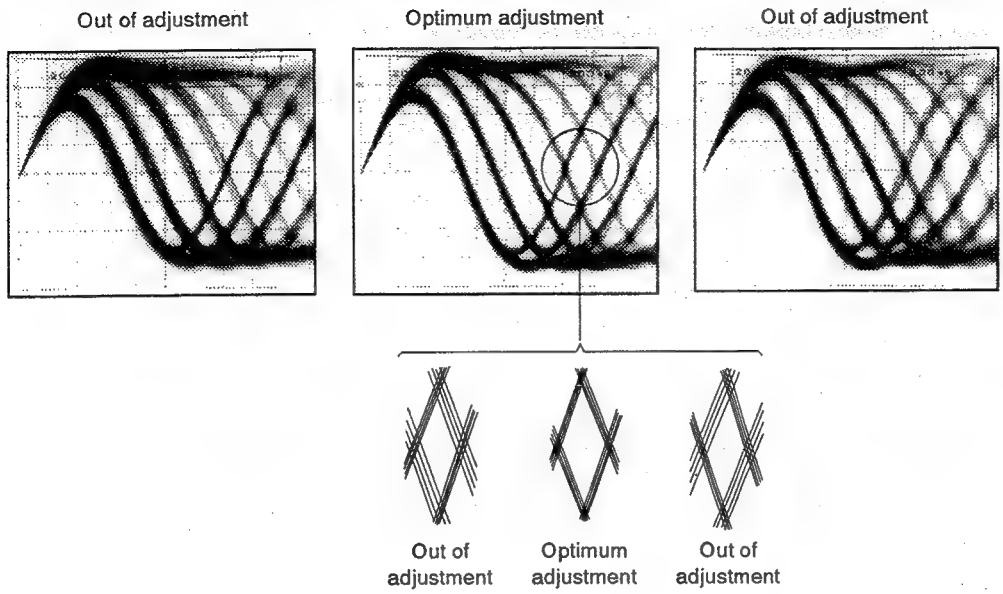


Figure 5 Eye pattern

5. RF Level Adjustment

● Objective	To optimize the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play VR1(laser power) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R=35 mm) with the MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| or REV |◁◁ / ◁◁ key, then press the PROGRAM key, then the PLAY/PAUSE ▷ / ▯▯ key in that order to close the respective servos and put the player into play mode.
2. Adjust VR1 (laser power) so that the RF signal amplitude is 1.2 Vp-p ± 0.1 V.

6. Focus Servo Loop Gain Adjustment

● Objective	To optimize the focus servo loop gain.		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy.		
● Measurement instrument connections	See figure 6. [Settings] CH1 CH2 20 mV/division 5 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR152 (FCS. GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| or REV |◁◁ / ◁◁ key to move the pickup to halfway across the disc (R=35 mm), then press the PROGRAM key, the PLAY/PAUSE ▷ / ▯▯ key, then the PLAY/PAUSE ▷ / ▯▯ key in that order to close the corresponding servos and put the player into play mode. (Press the " ▷ / ▯▯ " key twice.)
3. Adjust VR152 (FCS. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

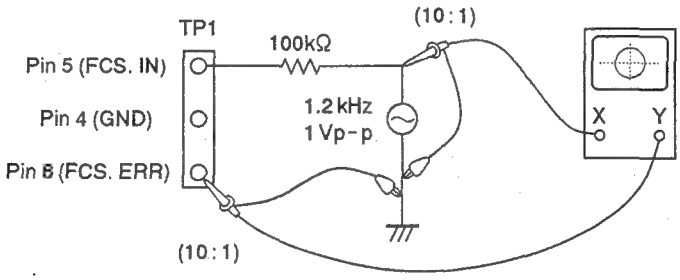
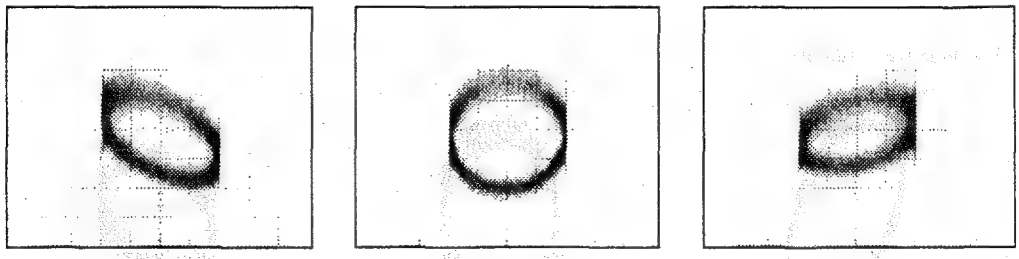


Figure 6

Focus Gain Adjustment



Higher gain | Optimum gain | Lower gain

7. Tracking Servo Loop Gain Adjustment

● Objective	To optimize the tracking servo loop gain.		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Figure 7. [Settings] CH1 CH2 50 mV/division 50 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR151 (TRK. GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| or REV |◁◁ / ◁◁ key to move the pickup to halfway across the disc (R=35 mm), then press the PROGRAM key, the PLAY/PAUSE ▷ / ▯▯ key, then the PLAY/PAUSE ▷ / ▯▯ key in that order to close the corresponding servos and put the player into play mode. (Press the " ▷ / ▯▯ " key twice.)
3. Adjust VR151 (TRK. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

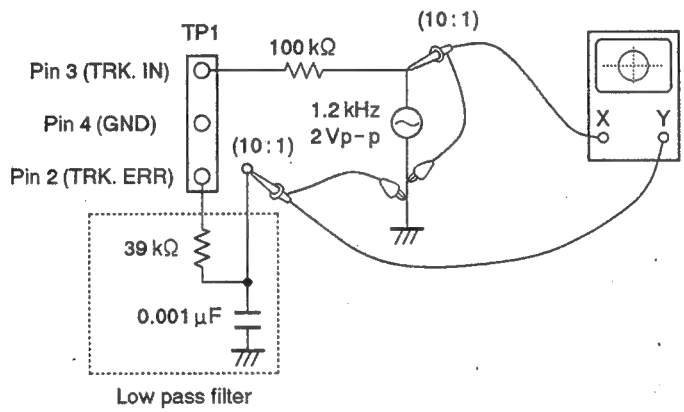
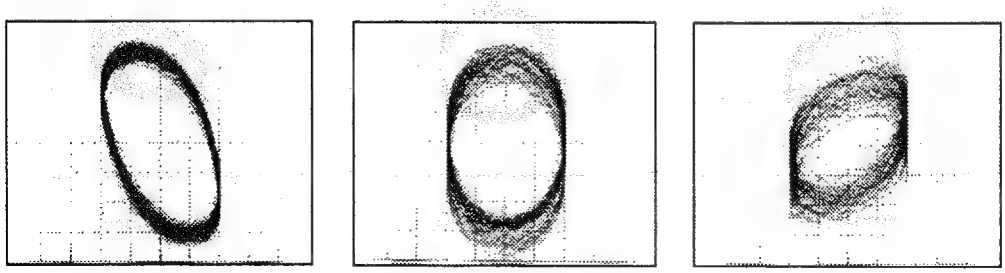


Figure 7

Tracking Gain Adjustment



Higher gain | Optimum gain | Lower gain

8. Focus Error Signal (Focus S Curve) Verification

● Objective ● Symptom when out of adjustment	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the waveform for the focus error signal.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS. ERR). [Settings] 100 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TP1 Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the PROGRAM key and observe the waveform in Figure 8 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the waveform is only output for a moment when the PROGRAM key is pressed, press this key over and over until you have checked the waveform.

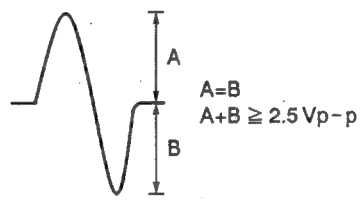


Figure 8

[Judging the pickup]

Do not judge the pickup until all the adjustment have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).
2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2 : 1 ratio or more).
4. The RF signal is too small (less than 0.8 Vp-p) and even if VR1 (laser power) is adjusted , the RF signal can not be brought up to the standard level.

8. RÉGLAGES

8.1 Méthodes de Réglage

Si le lecteur CD est mal réglé, il risque de ne plus fonctionner normalement, voire ne plus fonctionner du tout, même si le capteur et la circuiterie en présentent aucune anomalie. Par conséquent, ajuster le lecteur correctement en suivant les démarches de réglage.

● Points de Réglage/Point et Ordre de Vérification

Etape	Point	Point d'Essai	Emplacement du Réglage
1	Réglage du décalage de la mise au point	TP1, Broche 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Réglage du réseau de diffraction	TP1, Broche 2 (TRK. ERR)	Fente de réglage du réseau de diffraction
3	Réglage d'équilibrage d'erreur d'alignement	TP1, Broche 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Réglage d'inclinaison radiale/ tangentielle du capteur	TP1, Broche 1 (RF)	Vis de réglage d'inclinaison radiale, vis de réglage d'inclinaison tangentielle
5	Réglage du niveau RF	TP1, Broche 1 (RF)	VR1 (niveau RF)
6	Réglage de gain de bouncle asservie de la mise au point	TP1, Broche 5 (FCS. IN) TP1, Broche 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Réglage de gain de boucle asservie de l'alignement	TP1, Broche 3 (TRK. IN) TP1, Broche 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Vérification du signal d'erreur de la mise au point	TP1, Broche 6 (FCS. ERR)	————

● Tableau des abbréviations

FCS. ERR :Erreur de mise au point
FCS. OFS :Décalage de mise au point
TRK. ERR :Erreur d'alignement
TRK. BAL :Équilibrage d'erreur d'alignement
FCS GAN :Gain de mise au point
TRK GAN :Gain d'alignement
FCS. IN :Mise au point correcte
TRK. IN :Alignement correct

● Intruments de Mesure et Outils

1. Oscilloscope cathodeique à deux faisceaux (sonde 10 : 1)
2. Oscillateur de basse fréquence
3. Disque d'essai (YEDS-7)
4. Filtre passe-bas (39 kΩ + 0.001 μF)
5. Résistance (100 kΩ)
6. Outils conventionnels

● Point d'Essai et Positions de Réglage de la Résistance Variable

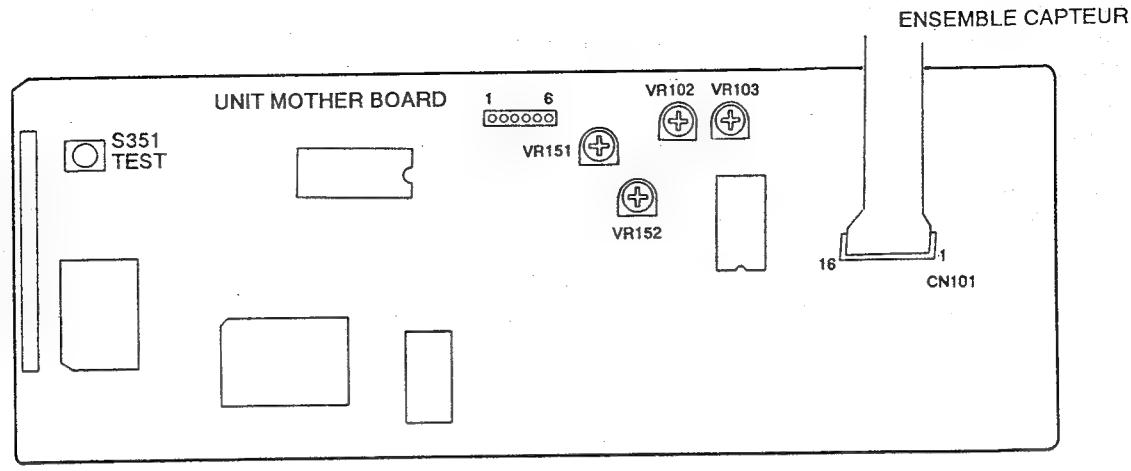


Figure 1 Emplacement des réglages

● Remarques

1. Utiliser une sonde 10:1 pour l'oscilloscope.
2. Toutes les positions (réglages) des boutons de l'oscilloscope, dans les démarches de réglage, sont conçues pour l'usage d'une sonde 10:1.

● Mode d'Essai

Ces modèles sont munis d'un mode d'essai, de façon que les réglages requis à la réparation puissent être effectués aisément. Quand ces modèles sont en mode d'essai, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire. Les réglages et les vérifications peuvent s'effectuer par l'enclenchement de ces touches, à conditions de suivre les démarches requises. Dans le cas de ces modèles, tous les réglages sont réalisés en mode d'essai.

[Mise en Mode d'Essai]

Voici la menière de mettre le modèle en mode d'essai.
1.Commuter l'interrupteur d'alimentation sur arrêt.
2. Appuyer sur la touche TEST (S351). (Voir Figure 1.)
3.Commuter l'interrupteur d'alimentation sur marche.

Quand le mode d'essai est correctement réglé, l'affichage est différent de celui qui apparaît généralement à la mise souns tension. Si l'affichage reste le même, le mode d'essai n'a pas été réglé correctement. Dans ce cas, répéter les étapes 1 à 3.

[Lecture de disque en mode d'essai]

En mode d'essai, comme les circuits servo fonctionnent de manière indépendante, la lecture d'un disque exige que les touches soient enclenchées dans l'ordre prescrit, afin de fermer les circuits servo.
Voici l'ordre d'enclenchement des touches pour reproduire un disque en mode d'essai.

PROGRAM	Allume la diode laser ferme le circuit servo de la mise au point.
⇩	
PLAY/PAUSE ▷ / ▯▯	Démarre le moteur de rotation et ferme le circuit servo de la rotation.
⇩	
PLAY/PAUSE ▷ / ▯▯	Ferme le circuit servo de l'alignement.

(Appuyer deux fois sur la touche " ▷ / ▯▯ ".)

Attendre 2 à 3 secondes entre chaque opération.

1. Réglage du Décalage de la Mise au Point

● Objectif	Règle le décalage CC de l'amplificateur d'erreur de mise au point.		
● Symptôme quand déréglé	Le lecteur ne procède plus à la mise au point et le signal RF n'est pas clair.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS. ERR). [Réglages] 5 mV/division 10 ms/division mode CC	● Etat du lecteur	Mode d'essai, arrêté (juste l'interrupteur d'alimentation commuté sur marche)
		● Emplacement du réglage	VR103(FCS. OFS)
		● Disque	Aucun requis

[Marche à suivre]

Ajuster VR103 (FCS. OFS) de façon que la tension à TP1 broche 6 (FCS. ERR) soit − 150 ± 50 mV.

2. Réglage du Réseau de Diffraction

● Objectif	Pour aligner les points du rayon laser producteur d'erreur d'alignement sur l'angle optimum de la piste.		
● Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible, les pistes sont sautées.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK. ERR) via un filtre passe-bas. (Voir Figure 2) [Réglages] 50 mV/division 5 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert. Fente de réglage du réseau de diffraction du capteur. YEDS-7

[Marche à suivre]

1. Déplacer le capteur à mi-chemin sur le disque (R=35 mm) par la touche MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| ou la touche REV |◁◁ / ◁◁ .
2. Appuyer sur la touche PROGRAM, puis sur la touche PLAY/PAUSE ▷ / ▯▯ , dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Insérer un tournevis ordinaire dans le réseau de diffraction pour trouver le point zéro. Pour plus de détails, voir page suivante.
4. Si l'on tourne lentement le tournevis dans le sens des aiguilles d'une montre à partir du point zéro, l'amplitude de l'onde augmente graduellement et si l'on continue à tourner le tournevis, l'amplitude de l'onde diminue de nouveau. Tourner le tournevis dans le sens des aiguilles d'une montre à paritir du point zéro et régler le réseau de diffraction au premier point oú l'amplitude de l'onde atteint son maximum.
   Référence: La Figure 3 illustre la relation entre l'angle du faisceau de l'alignement et la piste et la forme d'onde.

   Remarque: L'amplitude du signal d'erreur d'alignement se situe aux environs de 3 Vc-c (quand un filtre passe-bas de 39 kΩ ±0,001 μF est utilisé). Si cette amplitude est extrêmement petite (2 Vc-c ou moins), il peut s'ensuivre un mauvais fonctionnement de la lentille d'objectif ou du capteur. Si la différence entre l'amplitude du signal d'erreur au bord le plus intérieur et au bord le plus extérieur du disque est supérieure à 10%, ceci signifie que le réseau de diffraction n'est pas réglé à son point optimum. Dans ce cas, recommencer le réglage.
5. Replacer le capteur plus ou moins à mi-chemin sur le disque par la touche MANUAL/TRACK SEARCH REV |◁◁ / ◁◁ , appuyer sur la touche PLAY/PAUSE ▷ / ▯▯ et vérifier que le numéro de piste et la durée écoulée sont affichés sur le panneau avant. Si ces paramètres 'apparaissent pas ce moment, ou que la durée écoulée change de manière irrégulière, vérifier le point zéro et recommencer le réglage du réseau de diffraction.

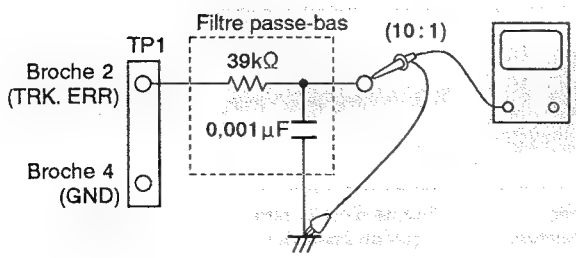
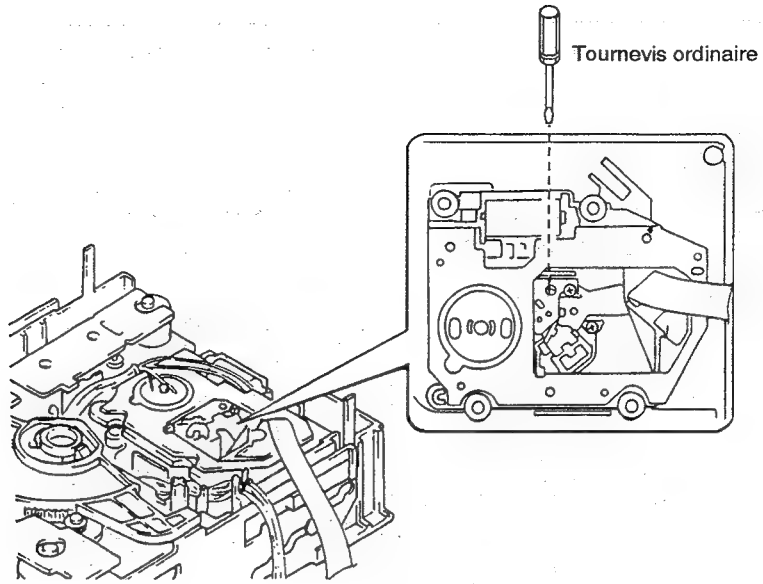


Figure 2



[Repérage du point zéro]

Quand le tournevis est introduit dans la fente de réglage du réseau de diffraction et que l'angle du réseau de diffraction est modifié, l'amplitude du signal d'erreur d'alignement à TP1, broche 2, change. Dans les limites de la plage du réseau de diffraction, il existe six emplacements où l'amplitude de l'onde atteint le minimum. Mais l'enveloppe de la forme d'onde n'est régulière qu'à un seul de ces emplacements. Ce point se situe à l'endroit où les trois rayons laser, divisés par le réseau de diffraction, se situent exactement sur la même piste (voir Figure 3).
Ce point s'appelle le point zéro. Lors du réglage du réseau de diffraction, ce point zéro est repéré et utilisé comme position de référnce.

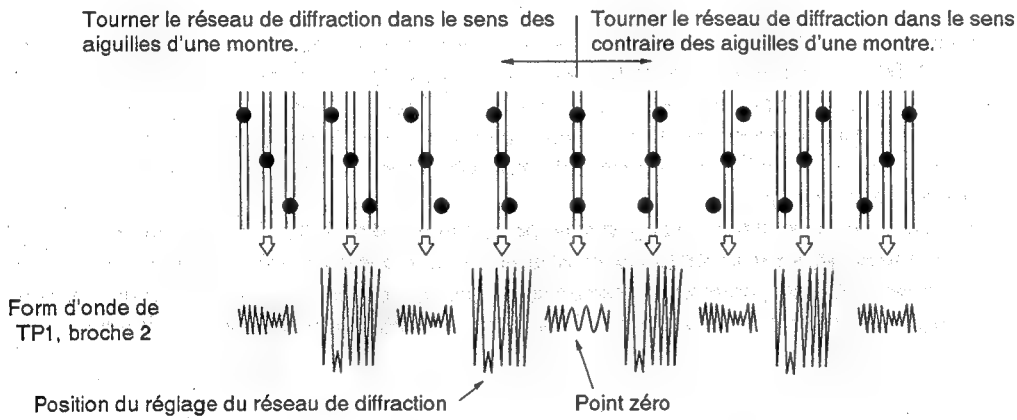
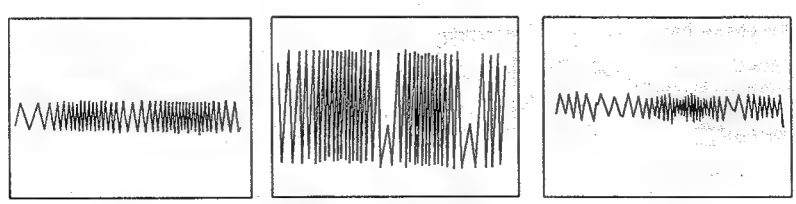


Figure 3

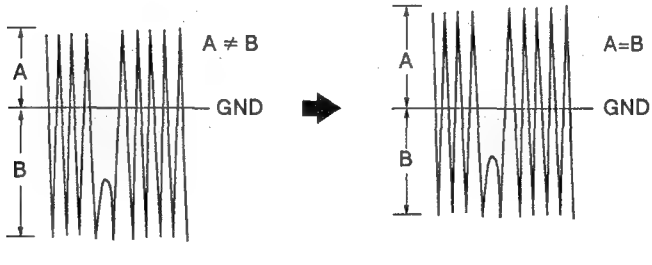


3. Réglage d'Équilibrage d'Erreur d'Alignement

● Objectif ● Symptôme quand déréglé	Pour corriger la variation de sensibilité de la photodiode d'alignement. La lecture ne commence pas, la recherche de piste est impossible.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK. ERR). Cette connexion peut être faite par l'intermédiaire d'un filtre passe-bas. [Réglages] 50 mV/division 5 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert. VR102(TRK. BAL) YEDS-7

[Marche à suivre]

1. Déplacer le capteur à mi-chemin sur le disque (R=35 mm) par la touche MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| ou la touche REV |◁◁ / ◁◁.
2. Appuyer sur la touche PROGRAM, puis sur la touche PLAY/PAUSE ▷ / ▯▯, dans cet ordre, pour fermeer le circuit servo de la mise au point, puis celui de la rotation.
3. Aligner la ligne lumineuse (masse) au centre de l'écran de l'oscilloscope et placer celui-ci en mode CC.
4. Ajuster VR102 (TRK. BAL) de façon que l'amplitude positive et l'amplitude négative du signal d'erreur d'alignement à TP1, broche 2 (TRK. ERR) soient identiques (c'est-à-dire, qu'il n'y ait aucun composant CC).



S'il y a un composant CC　　S'il n'y a pas de composant CC

4. Réglage d'Inclinaison Radiale/Tangentielle du Capteur

● Objectif	Pour régler l'angle du capteur par rapport au disque, de façon que les rayons laser frappent vericalement le disque et permettre ainsi la lecture optimum des signaux RF.		
● Symptôme quand déréglé	Son interrompu ; certains disques peuvent être lus et pas d'autres.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF). [Réglages] 20 mV/division 200 ns/division mode CA	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture Vis de réglage d'inclinaison radiale. Vis de réglage d'inclinaison tangentielle. YEDS-7

[Marche à suivre]

1. Dans le cas d'un lecteur multidisque, utiliser la touche MANUAL/ TRACK SEARCH FWD ▷▷ / ▷▷| ou la touche REV |◁◁ / ◁◁ pour déplacer le capteur à mi-chemin sur le disque (R=35 mm).
   Appuyer sur la touche PROGRAM, PLAY/PAUSE ▷ / ▯▯ et PLAY/PAUSE ▷ / ▯▯ dans cet ordre, afin de fermer le circuit servo de la mise au point, puis celui de la rotation et placer le lecteur en mode de lecture. (Appuyer deux fois sur la touche " ▷ / ▯▯ ".)
2. D'abord, ajuster la vis d'inclinaison radiale à l'aide un tournevis Phillips, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible.
3. Ensuite, ajuster la vis d'inclinaison tangentielle à l'aide un tournevis Phillips, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible (Figure 5).
4. Ajuster de nouveau la vis d'inclinaison radiale et la vis d'inclinaison tangentielle de façon que le motif en oeil soit le plus clairement visible. Le cas échéant, régler les deux vis de façon que le motif en oeil soit le plus clairement visible.

Remarque: "Radial" et "tangentiel" se rapportent aux sens par rapport au disque illustré à la Figure 4.

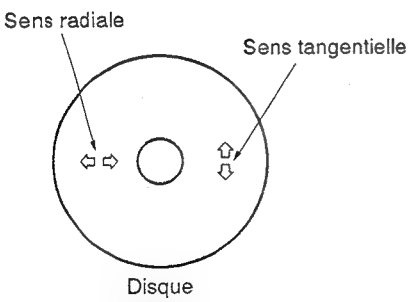
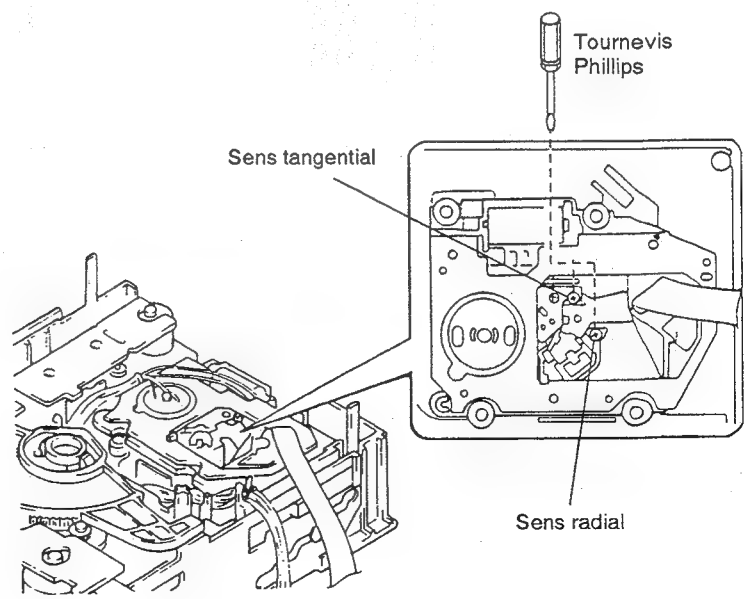


Figure 4



Emplacements des réglages

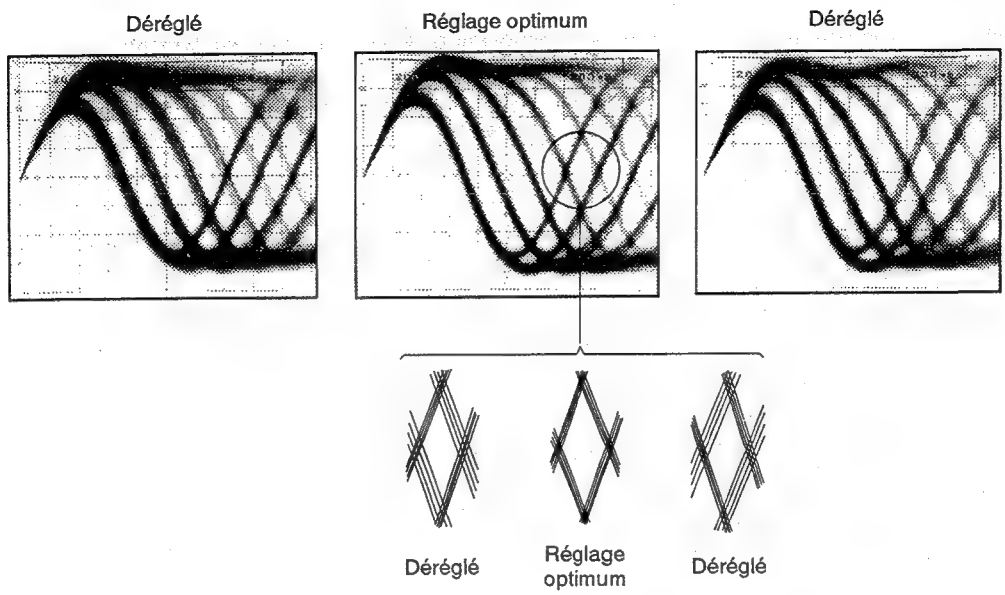


Figure 5 Motif en oeil

5. Réglage du Niveau RF (Niveau RF)

● Objectif	Pour optimaliser l'amplitude du signal RF de lecture		
● Symptôme quand déréglé	Pas de lecture ni de recherche		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF). [Réglages] 50 mV/division 10 ms/division mode CA	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR1 (alimentation du laser) YEDS-7

[Marche à suivre]

1. Placer le capteur à mi-chemin sur le disque (R=35 mm) à l'aide de la touche MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| ou la touche REV |◁◁ / ◁◁.
   Ensuite, appuyer sur la touche PROGRAM, puis sur la touche PLAY/PAUSE ▷ / ▯▯, dans cet ordre, pour fermer les circuits servo respectifs et mettre le lecteur en mode de lecteur.
2. Ajuster VR1 (alimentation du laser) de façon que l'amplitude du signal RF atteigne 1,2 Vc-c ± 0,1 V.

6. Réglage de Gain de Boucle Asservie de la Mise au Point

● Objectif ● Symptôme quand déréglé	Pour optimaliser le gain de la boucle d'asservissement de la mise au point. La lecture ne commence pas ou l'actuateur de la mise au point est parasité.		
● Raccordement des instruments de mesure	Voir Figure 6. [Réglages] GAN. 1 GAN. 2 20 mV/division 5mV/division mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR152 (FCS. GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| ou la touche REV |◁◁ / ◁◁ pour placer le capteur à mi-chemin sur le disque (R=35 mm). Ensuite, appuyer sur la touche PROGRAM, la touche PLAY/PAUSE ▷ / ▯▯ , puis sur la touche PLAY/PAUSE ▷ / ▯▯ , dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture. **(Appuyer deux fois sur la touche " ▷ / ▯▯ ".)**
3. Ajuster VR152 (FCS. GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

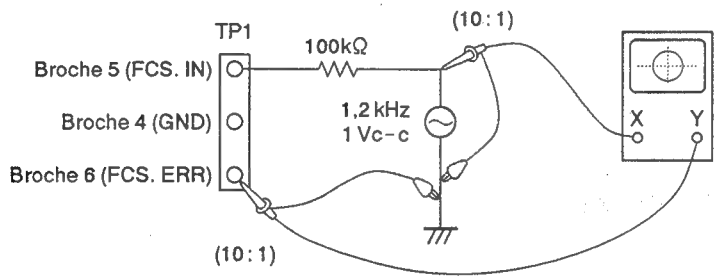
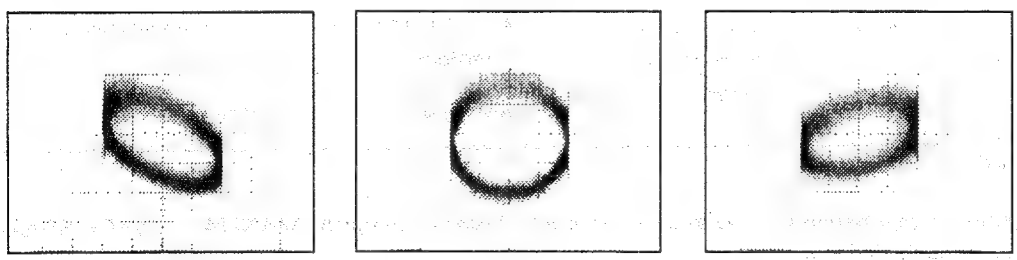


Figure 6

Réglage de gain de mise au point



Gain supérieur | Gain optimum | Gain inférieur

7. Réglage de Gain de Boucle Asservie de l'Alignement

● Objectif	Pour optimaliser le gain de la boucle d'asservissement de l'alignement.		
● Symptôme quand déréglé	La lecture ne commence pas, l'actuateur est parasité pendant la recherche, ou des pistes sont sautées.		
● Raccordement des instruments de mesure	Voir Figure 7. [Réglages] GAN. 1 GAN. 2 50 mV/division 50 mV/division mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR151 (TRK. GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 2 Vc-c.
2. Appuyer sur la touche MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| ou la touche REV |◁◁ / ◁◁ pour placer le capteur à mi-chemin sur le disque (R=35 mm). Ensuite, appuyer sur la touche PROGRAM, la touche PLAY/PAUSE ▷ / ▯▯, puis sur la touche PLAY/PAUSE ▷ / ▯▯, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture. **(Appuyer deux fois sur la touche " ▷ / ▯▯ ".)**
3. Ajuster VR151 (TRK. GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

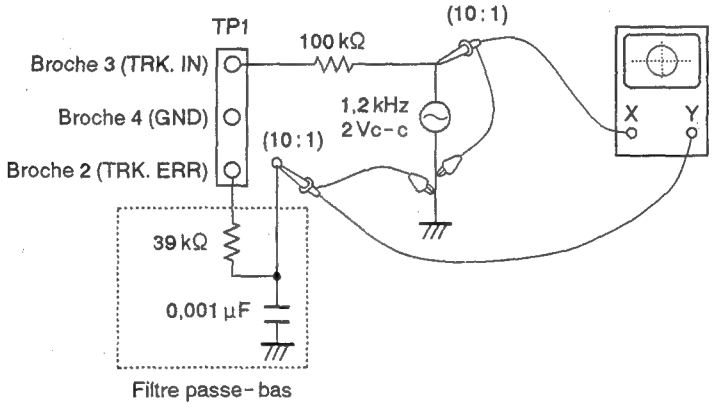
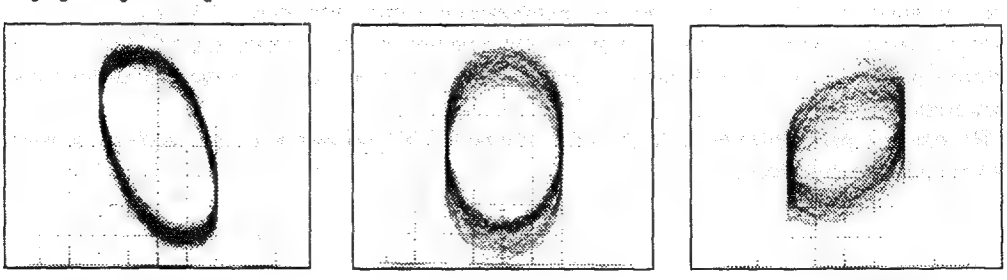


Figure 7

Réglage de gain d'alignement



Gain supérieur | Gain optimum | Gain inférieur

8. Vérification du Signal d'Erreur de la Mise au Point

● Objectif ● Symptôme quand déréglé	Pour juger si le capteur est bon ou pas, en observant le signal d'erreur de la mise au point. L'état du capteur s'évalue à partir de l'amplitude du signal d'erreur d'alignement (comme décrit dans le paragraphe relatif à l'équilibrage d'erreur d'alignement), ainsi qu'à paritir de la forme d'onde du signal d'erreur de mise au point.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS. ERR). [Réglages] 100 mV/division 5 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode de test, arrêt Aucun YEDS-7

[Marche à suivre]

1. Raccorder TP1, broche 5 à la masse.
2. Installer le disque.
3. Tout en regardant l'écran de l'oscilloscope, appuyer sur la touche PROGRAM et observer la forme d'onde de la Figure 8, pendant quelques instants. Vérifier que l'amplitude atteint au moins 2,5 Vc-c et que les amplitudes positive et négatives soient égales. Comme la forme ne sort que pour un moment, quand la touche PROGRAM est enclenchée, appuyer sur à plusieurs reprises sur cette touche, jusqu'à ce que la forme d'onde ait été vérifiée.

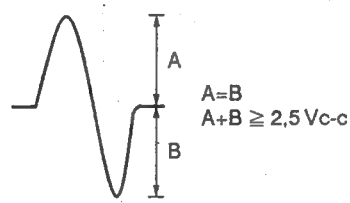


Figure 8

[Evaluation du capteur]

Ne pas tenter d'évaluer l'état du capteur tant que tous les réglages ne sont pas corrects. Les cas suivants témoignent de l'anomalie du capteur.

1. L'amplitude du signal d'erreur d'alignement est extrêmement petite (inférieure à 2 Vc-c).
2. L'amplitude du signal d'erreur de mise au point est extrêmement petite (inférieure à 2,5 Vc-c).
3. Les amplitudes positive et négative du signal d'erreur de mise au point sont extrêmement asymétriques (taux 2:1 ou plus).
4. Le signal RF est trop petit (inférieur à 0,8 Vc-c) et même si VR1 (alimentation du laser) est ajustée, le signal RF ne peut être élevé au niveau standard.

8. AJUSTES

8.1 Métodos de Ajuste

Si un reproductor de discos compactos se ajusta incorrecta o inadecuadamente, puede funcionar mal o no trabajar incluso aunque no exista ningún problema en el captor ni en los circuitos. Ajuste correctamente siguiendo el procedimiento de ajuste.

● Ítemes de Ajuste/Verificación y Orden

Paso	Ítem	Punto de Prueba	Lugar de Ajuste
1	Ajuste del descentramiento de enfoque	TP1, Patilla 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Ajuste de retícula	TP1, Patilla 2 (TRK. ERR)	Ranura de ajuste de retícula
3	Ajuste del equilibrio de ajuste de seguimiento	TP1, Patilla 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Ajuste de la inclinación en sentido radial / tangencial del captor	TP1, Patilla 1 (RF)	Tornillo de ajuste de la inclinación radial. Tornillo de ajuste de la inclinación tangencial
5	Ajuste del nivel de RF	TP1, Patilla 1 (RF)	VR1 (Nivel de RF)
6	Ajuste de la ganancia del bucle del servo de enfoque	TP1, Patilla 5 (FCS. IN) TP1, Patilla 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Ajuste de la ganancia del bucle del servo de seguimiento	TP1, Patilla 3 (TRK. IN) TP1, Patilla 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Verificación de la señal de error de enfoque	TP1, Patilla 6 (FCS. ERR)	————

● **Tabla de abreviaturas**

FCS. ERR :Error de enfoque
FCS. OFS :Descentramiento de enfoque
TRK. ERR :Error de seguimiento
TRK. BAL :Equilibrio de seguimiento
FCS GAN :Ganacia de enfoque
TRK GAN :Ganacia de seguimiento
FCS. IN :Entrada de enfoque
TRK. IN :Entrada de seguimiento

● Instrumentos y Herramientas de Medición

1. Osciloscopio de doble traza (Sonda de 10:1)
2. Oscilador de baja frecuencia
3. Disco de prueba (YEDS-7)
4. Filtro de paso bajo (39 kΩ + 0,001 μF)
5. Resistor (100 kΩ)
6. Herramientas estándar

● Ubicación de Los Puntos de Prueba y Los Resistores Variables de Ajuste

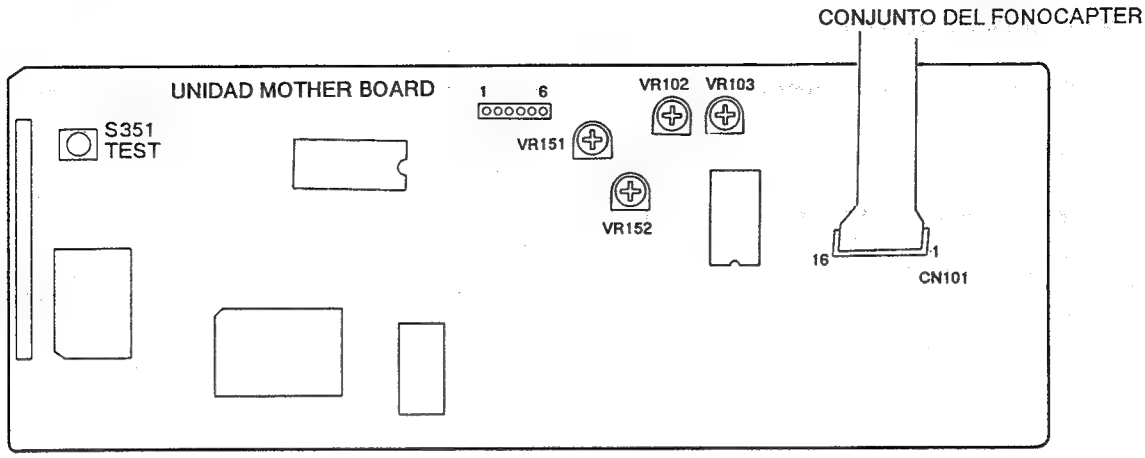


Figura 1 Lugares de ajuste

● Notas

1. Emplee una sonda de 10:1 para el osciloscopio.
2. Todas las posiciones de los mandos (ajustes) para el osciloscopio de los procedimientos de ajuste son para cuando se emplee la sonda de 10:1.

● Modo de Prueba

Estos modelos poseen un modo de prueba que permite realizar fácilmente los ajustes y las comprobaciones requeridos para el servicio. Cuando estos modelos estén en el modo de prueba, las teclas del panel frontal trabajarán de forma diferente a la normal. Los ajustes y las comprobaciones podrán realizarse accionando estas teclas de acuerdo con el procedimiento correcto. Para estos modelos, todos los ajustes se realizarán en el modo de prueba.

[Puesta de estos modelos en el modo de prueba]

A continuación se indica cómo poner estos modelos en el modo de prueba.
1.Ponga en OFF el interruptor de alimentación.
2. Ponga la tecla TEST (S351). (Consulte la figura 1.)
3.Ponga en ON el interruptor de alimentación.

Cuando haya ajustado correctamente el modo de prueba, la visualización será diferente a la obtenida normalmente al conectar la alimentación. Si la visualización sigue siento la normal, el modo de prueba no se habrá ajustado normalmente, por lo que tendrá que repetir los pasos 1 a 3.

[Desactivación del modo de prueba]

A continuación se indica el procedimiento para desactivar el modo de prueba.
1. Presione la tecla STOP y cese todas las operaciones.
2. Ponga en OFF el interruptor de alimentación del panel frontal.

[Operaciones de teclas en el modo de prueba]

Código	Nombre de la Tecla	Función en el Modo de Prueba	Explicación
	PROGRAM	Cierre del servo de enfoque	El diodo láser se encenderá y el actuador de enfoque se eleva, después se desciende lentamente, y el servo de enfoque se cerrará en el punto en el que el objetivo se enfoque sobre el disco. Con el reproductor en este estado, si gira ligeramente con la mano el disco parado, podrá oír el sonido del servo de enfoque. Si puede oír este sonido, el servo de enfoque estará funcionando correctamente. Si presiona esta tecla sin disco montado, el diodo láser se encenderá, el actuador de enfoque se vera empujado hacia arriba, y después se levantará y descenderá y se eleva dos veces, y volverá a su posición original.
▷/▯▯	PLAY/PAUSE	Activación del servo del eje	Pondrá en marcha el motor del eje haciéndolo girar hacia la derecha y después la rotación del disco alcanzará la velocidad prescrita (unas 500 rpm en la periferia interior), y pondrá el servo del eje en un bucle cerrado. Tenga cuidado. Si presiona esta tecla cuando no haya disco montado, el motor del eje girará a la velocidad máxima. Si el servo de enfoque no pasa correctamente a un bucle cerrado, o si el haz lasérico incide en la sección del espejo en el la periferia del disco, ocurrirá el mismo síntoma.
▷/▯▯	PLAY/PAUSE	Apertura/cierre del servo de seguimiento	Si presiona esta tecla cuando el servo de enfoque y el servo del eje están funcionando correctamente en bucles cerrados, el servo de seguimiento se pondrá en bucle cerrado, en el panel frontal se visualizarán el número de canción que esté reproduciéndose y el tiempo transcurrido, y se producirá la salida de la señal de reproducción. Si el tiempo transcurrido no se visualiza o no se cuenta correctamente, o si el sonido no se reproduce correctamente, es posible que el rayo lasérico esté incidiendo en la sección sin sonido grabado en el borde exterior del disco, o que exista algún otro problema. Esta tecla es basculante de acción alternativa, y abre/cierra el servo de seguimiento alternativamente. Esta tecla no funcionará cuando no haya disco montado.

Código	Nombre de la Tecla	Función en el Modo de Prueba	Explicación
⏮ / ◀◀	MANUAL/ TRACK SEARCH REV	Retroceso del carro (hacia adentro)	Moverá la posición del captor hacia el diámetro interior del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
▶▶ / ⏭	MANUAL/ TRACK SEARCH FWD	Avance del carro (hacia afuera)	Moverá la posición del captor hacia la periferia del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
□	STOP	Parada	Inicializa y se para la rotacion del desco. El captor y el disco permanecen donde están cuando se presiona esta tecla.
⏏	EJECT	Expulsión del cargador de discos compactos	Almacenará el disco 1 en el cargador de discos compactos, y después expulsará dicho cargador. Sin embargo, aunque el cargador de discos compactos sea expulsado, el captor no volverá a su posición de reposo. Aunque vuelva a montar el cargador de discos compactos, el captor permanecerá donde estaba.

Nota : Cuando inserte el cargador, el disco 1 del mismo se cargará automáticamente.

2. Ajuste de Retícula

● Objetivo	Alineación de los puntos del haz lasárico de generación de error de seguimiento al ángulo óptimo en la pista.		
● Síntomas en caso de desajuste	La reproducción no se inicia, la búsqueda de canciones es imposible, las pistas se saltan.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla2 (TRK. ERR)a través de un filtro de paso bajo. (Consulte la figura 2) [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto. Ranura de ajuste de retícula del captor YEDS-7

[Procedimiento]

1. Mueva el captor hasta el la mitad del disco (R=35mm) con la tecla MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| o la tecla REV |◁◁ / ◁◁ .
2. Presione la tecla PROGRAM, y después la tecla PLAY/PAUSE ▷ / ▯▯ , por este orden, a fin de cerrar el servo de enfoque y
3. Inserte un destornillador normal en la ranura de ajuste de la retícula y ajuste la retícula hasta encontrar el punto nulo. Para más detalles, consulte la página siguiente.
4. Si gira lentamente el destornillador hacia la derecha desde el punto nulo, la amplitud de la onda aumentará gradualmente. Después, si continúa girando el destornillador, la amplitud de la onda se volverá otra vez más pequeña. Gire el distornillador hacia la derecha desde el punto nulo y ajuste la retícula al primer punto en el que la amplitud de la onda alcance su valor máximo.

   Referencia : En la figura 3 se muestra la relación entre el ángulo del haz de seguimiento con la pista y la forma de onda.

   Nota : La amplitud de la señal de error de seguimiento será de aproximadamente 3 Vp-p (cuando se emplee un filtro de paso bajo de 39 kΩ , 0,001 μF). Si la amplitud está extremadamente pequeña (2 Vp-p ó menos), la causa será el funcionamiento malo en el lente objetivo o en el captador. Si la diferencia entre la amplitud de la señal de error en el borde interior y exterior del disco es superior al 10%, la retícula no estará ajustada al punto óptimo, por lo que tendrá que volver a ajustaria.
5. Devuelva el captor hasta la mitad más o menos del disco con la tecla MANUAL/TRACK SEARCH REV |◁◁ / ◁◁ , presione la tecla PAUSE ▯▯ , y vuelva a comprobar si en el panel frontal se visualizan el número de canción y el tiempo transcurrido. Si no se visualizan esta vez, o si el tiempo transcurrido cambia irregularmente, vuelva a comprobar el punto nulo y ajuste otra vez la retícula.

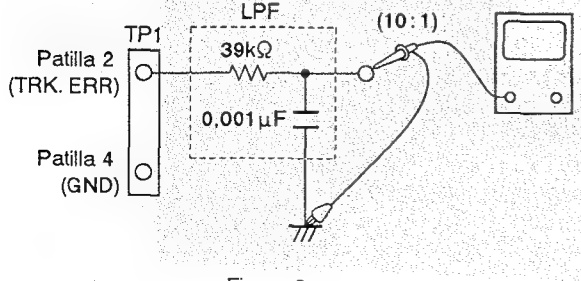
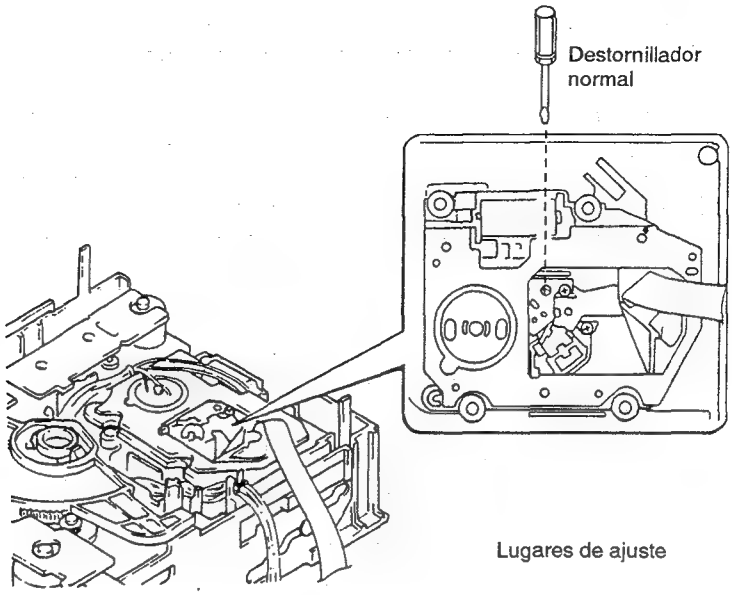


Figura 2



[Cómo encontrar el punto nulo]

Cuando inserte el destornillador normal en la ranura para el ajuste de la retícula y cambie el ángulo de la misma. La amplitud de la señal de error de seguimiento de TP1, patilla 2, cambiará. Dentro del margen para la retícula existen cinco o seis lugares en los que la amplitud alcanza el valor mínimo. De estos cinco o seis lugares, solamente hay uno en el que la envolvente de la forma de onda es uniforme. Este lugar es donde los tres haces lasércicos divididos por la retícula se encuentran exactamente sobre la misma pista. (Consulte la figura 3.)
Este punto se denomina punto nulo. Cuando ajuste la retícula, este punto se encontrará y empleará como posición de referencia.

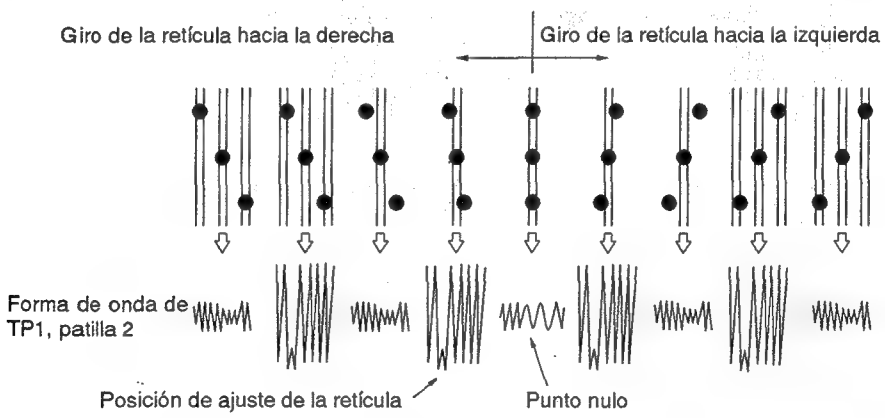
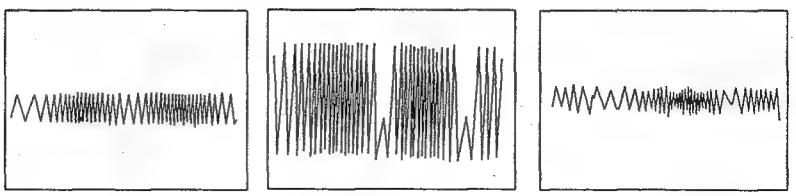


Figura 3



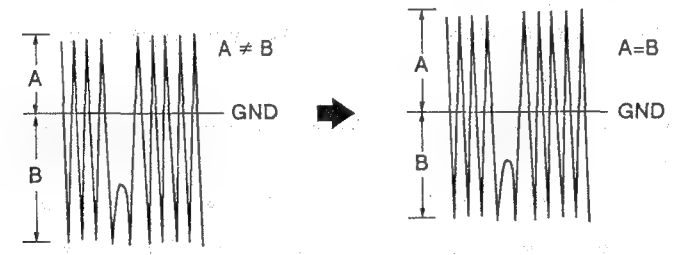
Forma de onda del punto nulo | Forma de onda de amplitud máxima | Forma de onda que no es el punto nulo

3. Ajuste del Equilibrio de Error de Seguimiento

● Objetivo	Corrección de la variación de la sensibilidad del fotodiodo de seguimiento.		
● Síntomas en caso de desajuste	La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2 (TRK. ERR). Esta conexión puede realizarse a través de un filtro de paso bajo [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto VR102 (TRK. BAL) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R=35 mm) con la tecla MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| o la tecla REV |◁◁ / ◁◁ .
2. Presione la tecla PROGRAM, y después la tecla **PLAY/PAUSE** ▷ / ▯▯, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Haga coincidir la línea brillante (masa) del centro de la pantalla del osciloscopio y ponga éste en el modo de CC.
4. Ajuste VR102 (TRK. BAL) de forma que la amplitud positiva y la negativa de la señal de error de seguimiento de TP1 patilla 2 (TRK. ERR) sean iguales (en otras palabras, de forma que no haya componente de CC).



Cuando hay componente de CC

Cuando no hay componente de CC

4. Ajuste de la Inclinación en Sentido Radial / Tangencial del Captor

● Objetivo	Ajustar el ángulo del captor en relación con el disco de forma que los haces lasércos incidan perpendicularmente sobre el mismo a fin de poder leer con la mayor exactitud las señales de RF.		
● Síntomas en caso de desajuste	Sonido quebrado, algunos discos pueden reproducirse pero otros no.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1 (RF). [Ajustes] 20 mV/división 200 ns/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción Tornillo de ajuste de la inclinación radial y tornillo de ajuste de la inclinación tangencial YEDS-7

[Procedimiento]

1. Para un tipo de reproducción múltiple de disco compacto, emplee la tecla MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| o la tecla REV |◁◁ / ◁◁ a fin de mover el captor hasta la mitad del disco (R=35 mm)
   Presione la tecla PROGRAM, la tecla PLAY/PAUSE ▷ / ▯▯, y después la tecla PLAY/PAUSE ▷ / ▯▯, por este orden, a fin de cerrar el servo de enfoque, dispués el servo del eje, y por último para poner el reproductor en el modo de reproducción. (**Oprima la tecla " ▷ / ▯▯ " dos veces.**)
2. En primer lugar, gire el tornillo de ajuste de inclinación radial con un destornillador Phillips hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad.
3. A continuación, ajuste el tornillo de ajuste de inclinación tangencial con un destornillador Phillips hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad (figura 5).
4. Vuelva a girar el tornillo de ajuste de inclinación radial y el tornillo de inclinación tangencial hasta que el patrón ocular pueda verse con la mayor claridad. Si es necesario, ajuste alternativamente los dos tornillos hasta que el patrón ocular pueda verse con la mayor claridad.

Nota:Radial y tangencial significan las direcciones en relación con el disco mostrado en la figura 4.

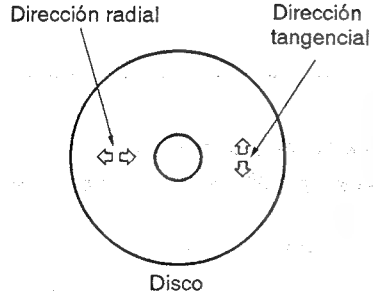
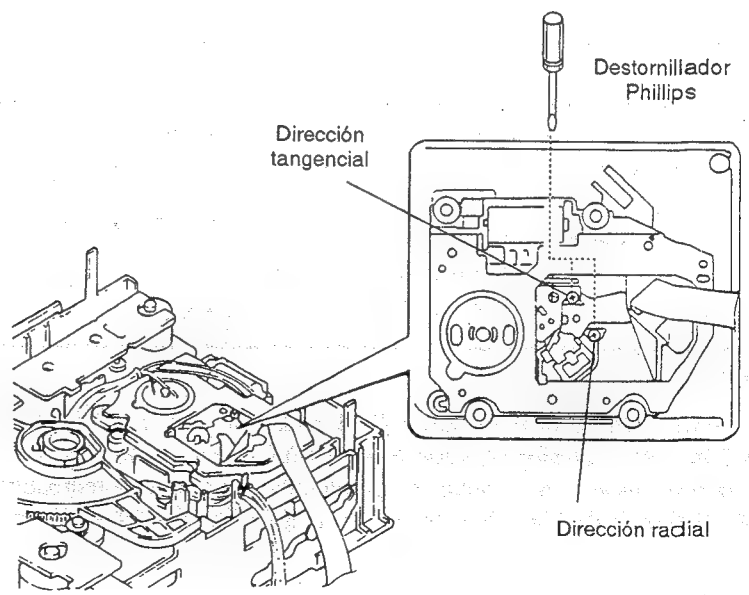


Figura 4



Lugares de ajuste

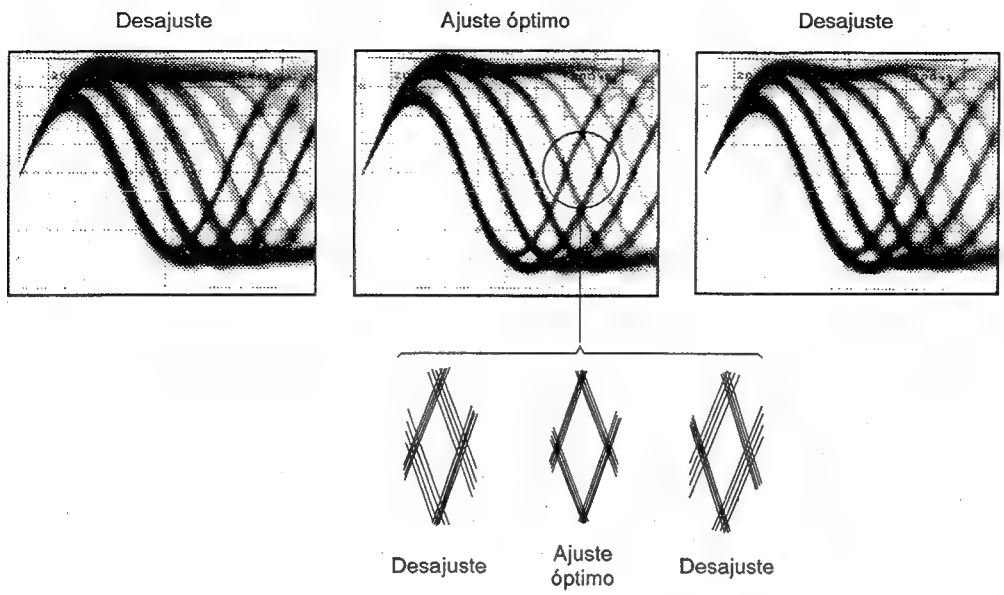


Figura 5 Patron optico

5. Ajuste del Nivel de RF

● Objetivo	Optimización de la amplitud de la señal de RF de reproducción.		
● Síntomas en caso de desajuste	La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1 (RF). [Ajustes] 50 mV/división 10 ms/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR1 (potencia de láser) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R=35 mm) con la tecla MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| o la tecla REV |◁◁ / ◁◁ , presione la tecla PROGRAM, después la tecla PLAY/PAUSE ▷ / ▯▯, por este orden a fin de cerrar los servos respectivos, y ponga el reproductor en el mode de reproducción.
2. Ajuste VR1 (potencia de láser) de forma que la amplitud de la señal de RF sea de 1,2 Vp-p ± 0,1 V.

6. Ajuste de la Ganancia del Bucle del Servo de Enfoque

● Objetivo	Optimización de la ganancia del bucle del servo de enfoque.		
● Síntomas en caso de desajuste	La reproducción no se inicia o el actuador de enfoque produce ruido.		
● Conexión de los instrumentos de medición	Consulte la fugura 6. [Ajustes] CH1 CH2 20 mV/división 5mV/división modo X-Y	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR152 (FCS. GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| o la tecla REV |◁◁ / ◁◁ para mover el captor hasta la mitad del disco (R=35 mm), y después presione la tecla PROGRAM, la tecla PLAY/PAUSE ▷ / ▯▯ , y después la tecla PLAY/PAUSE ▷ / ▯▯ , por este orden, a fin de cerrar los servos correspondientes y poner el reproductor en el modo de reproducción. **(Oprima la tecla " ▷ / ▯▯ " dos veces.)**
3. Ajuste VR152 (FCS. GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

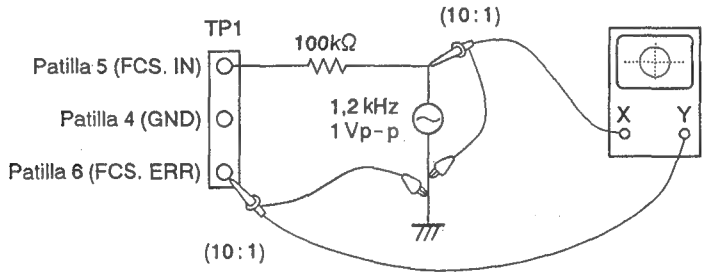
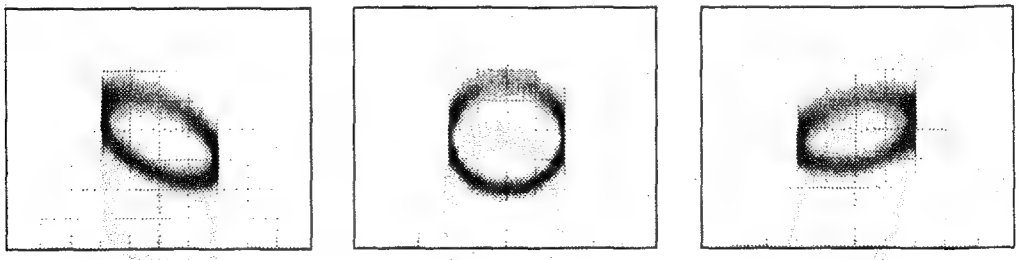


Figura 6

Ajuste de la ganancia de enfoque



Ganancia superio Ganancia óptima Ganancia inferior

7. Ajuste de la Ganancia del Bucle del Servo de Seguimiento

● Objetivo ● Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de seguimiento. La reproducción no se inicia, el actuador de enfoque produce ruido, o se saltan pistas.		
● Conexión de los instrumentos de medición	Consulte la figura 7. [Ajustes] CH1 CH2 50 mV/división 50 mV/división modo X-Y	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR151(TRK. GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 2 Vp-p.
2. Presione la tecla MANUAL/TRACK SEARCH FWD ▷▷ / ▷▷| o la tecla REV |◁◁ / ◁◁ para mover el captor hasta la mitad del disco (R=35 mm), y después presione la tecla PROGRAM, la tecla PLAY/PAUSE ▷ / ▯▯, y la tecla PLAY/PAUSE ▷ / ▯▯, por este orden, a fin de cerrar los servos respectivos y poner el reproductor en el modo de reproducción. (Oprima la tecla " ▷ / ▯▯ " dos veces.)
3. Ajuste VR151 (TRK. GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

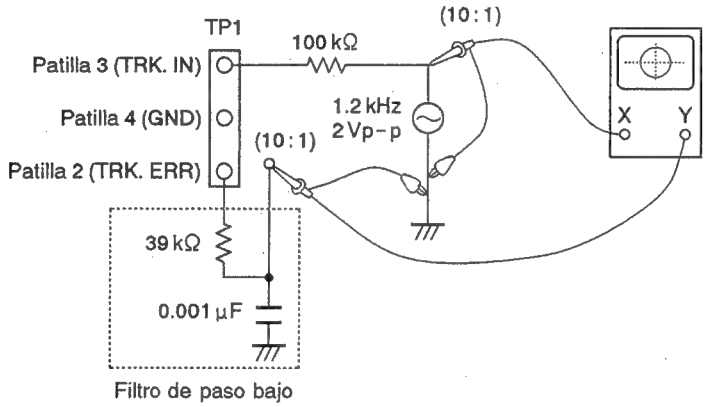
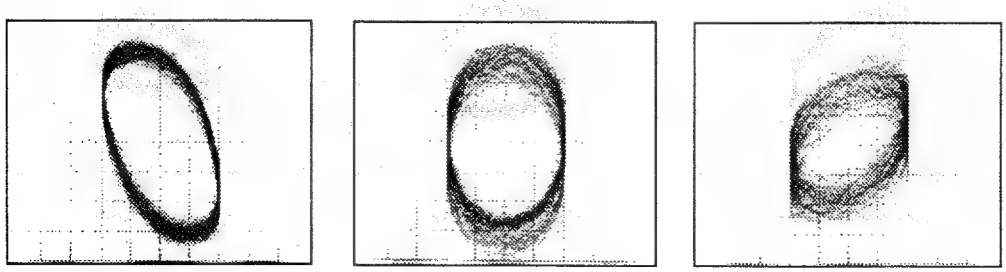


Figura 7

Ajuste de la ganancia de seguimiento



Ganancia superior | Ganancia óptima | Ganancia inferior

8. Verificación de la Señal de Error de Enfoque (Curva S de Enfoque)

● Objetivo ● Síntomas en caso de desajuste	Juzgar si el captor est'a bien o no observando la señal de error de enfoque. El captor se juzga por la amplitud de la señal de error de seguimiento (como se ha indicado en la sección sobre el ajuste del equilibrio de error de seguimiento) y la forma de onda de la señal de error de enfoque.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6 (FCS. ERR). [Ajustes] 100 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, parada Ninguno YEDS-7

[Precedimiento]

1. Conecte TP1, patilla 5, a masa.
2. Coloque el disco.
3. Contemplando la pantalla del osciloscopio, presione la tecla PROGRAM y observe durante un momento la forma de onda de la figura 8. Verifique si la amplitud es de 2,5 Vp-p por lo menos y si la amplitud de las partes positiva y negativa son iguales. Como la forma de onda solamente sale durante un momento cuando se presiona la tecla PROGRAM, presione una y otra vez esta tecla hasta que logre comprobar la forma de onda.

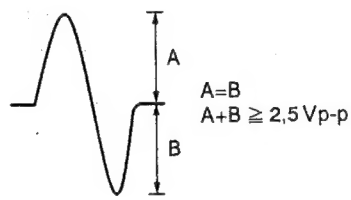


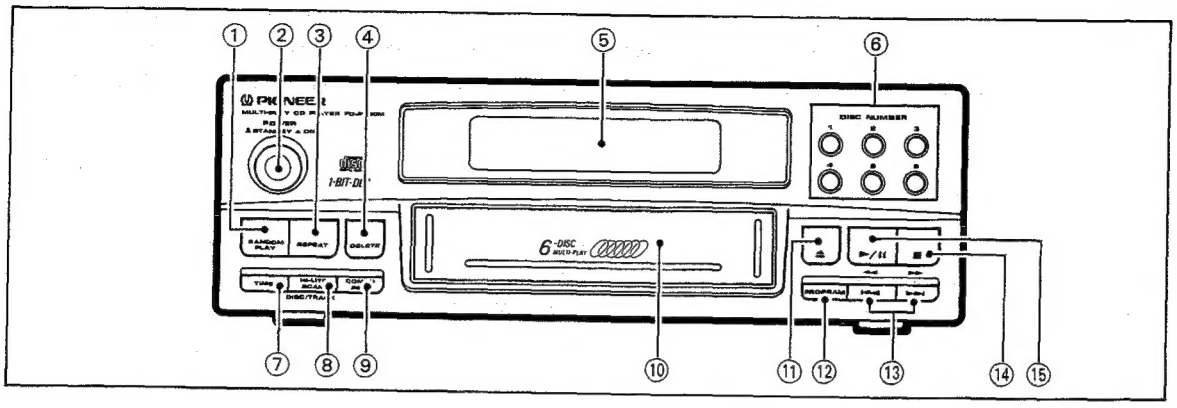
Figura 8

[Juicio sobre el captor]

No juzgue el captor hasta haber finalizado correctamente todos los ajustes. En los casos siguiented es posible que haya algo erróneo en el captor.

1. La amplitud de la señal de error de seguimiento es extremadamente pequeña (menos de 2 Vp-p).
2. La amplitud de la señal de error de enfoque es extremadamente pequeña (menos de 2,5 Vp-p).
3. Las amplitudes de las partes positiva y negativa de la señal de error de enfoque son extremadamente asimétricas (relación de 2:1 o superior).
4. La señal de RF es demasiado pequeña (menos de 0,8 Vp-p) y aunque se ajuste VR1 (potencia de láser), la señal de RF no puede aumentarse hasta el nivel estándar.

9. PANEL FACILITIES



① RANDOM PLAY button

Press to begin random playback.

② POWER switch (■ STANDBY/ ▬ ON)

Press to turn power to the unit ON and STANDBY.

③ REPEAT button

Press this button for repeat playback. Pressing the button once, twice or three times will change the repeat mode from single track repeat, to all tracks repeat, and repeat playback cancellation respectively.

④ DELETE button

Pressing this button and then selecting the discs with DISC NUMBER buttons (1 through 6) or selecting the tracks with Manual/Track search buttons will result in the selected discs and tracks not being played even when Play/Pause button is pressed.

⑤ Display

⑥ DISC NUMBER buttons (1 ~ 6)

Use to select disc numbers for playback or programming.

⑦ TIME button

This button selects the display mode of the indicator panel.

When the button is pressed during CD playback, the indication changes from TIME, REMAIN, to TOTAL in that order. (For details concerning the display contents, refer to the explanation about the "DISPLAY SECTION")

⑧ HI-LITE SCAN (DISC/TRACK) button

DISC SCAN: Press this button during stop mode to play back a 10-second passage positioned one minute after the beginning of the first track for each disc contained in the magazine in the order of disc 1 through disc 6.

TRACK SCAN: Press the button during DISC SCAN to play back a 10-second passage positioned one minute after the beginning of each track in sequence for each disc contained in the magazine in the order of disc 1 through disc 6.

To reset the starting time of HI-LITE SCAN, press HI-LITE SCAN button during normal playback. This stores the elapsed play time and plays back each of the 10-second passages beginning from the stored time.

⑨ COMPU PGM button

If this button is pressed for A.S.E.S. recording and Manual/Track search buttons are used to designate the length (in minutes) of the recording tape, the CD player will automatically select and program the CD tracks to be recorded. The tracks will be selected for recording so that the empty portion remaining at the end of the tape will be as short as possible. For details regarding this function, consult the operating instructions for the receiver used.

⑩ Magazine insertion slot

⑪ Eject button (⏏)

Press to eject a magazine. When pressed, any magazine inside is expelled forward.

⑫ PROGRAM button

Use to program a sequence of tracks

- Press this button after selecting a desired disc and track with DISC NUMBER and Track search buttons. Tracks will be added in the order in which they are specified.
- If only a DISC NUMBER button is pressed, all tracks on the specified disc will be added to the program. The letters [AL] will be appear on the indicator.

⑬ Manual/Track search buttons (⏮ ◀◀, ▶▶ ⏭)

To perform track search in normal playback, programmed playback or PAUSE mode.

You can advance to the next track or go back to the previous one by using Manual/Track search buttons. The fast forward or fast reverse function will be activated by holding down these buttons.

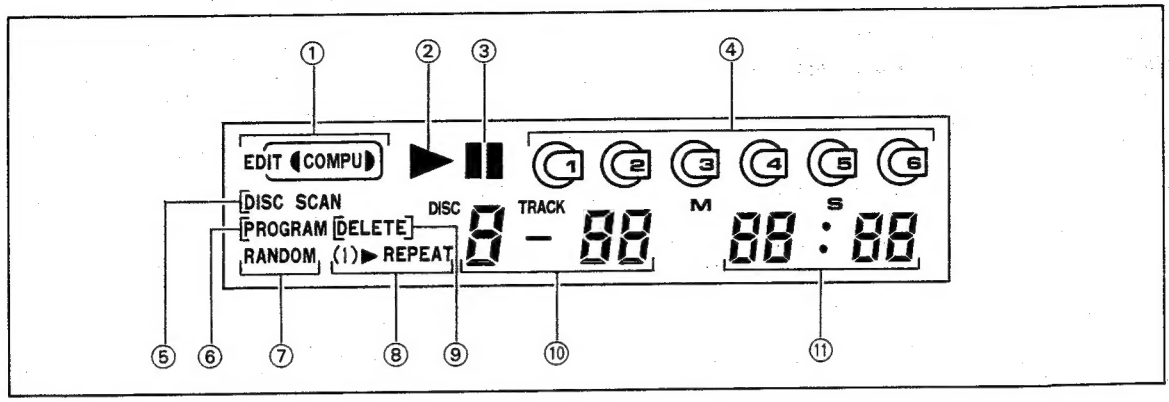
⑭ Stop button (■)

Press to stop playback. When pressed, the player goes into stop mode and all operations stop.

When pressed during stop mode, the program stored in memory is cleared.

⑮ Play/Pause button (▶/❚❚)

Playback will begin if this button is pressed when the CD player is stopped or paused. Pressing the button during playback will cause the player to temporarily pause.



DISPLAY SECTION

① Pressing COMPU PGM button to ON will cause ◖ ◗ mark beside the [COMPU] indicator to light.
② Lights during playback.
③ Lights during pause mode, when playback is temporarily interrupted.
④ If a nonexistent disc is searched for, the corresponding disc symbol will light up.
⑤ The [DISC SCAN] indicator blinks during disc scan and the [SCAN] indicator blinks during track scan.
⑥ Lights after programming (after program has been memorized).
⑦ Lights during random playback.
⑧ Lights during repeat playback.
⑨ Lights during the Delete program.
⑩ **DISC** : Indicates disc number (1 ~ 6) during playback or search.
TRACK : Indicates track number (01 ~ 99) during playback or search.
⑪ Display change
Changes when TIME button is pressed during CD playback.

TIME : Displays the track number of the track being played (TRACK) and the elapsed time (minutes and seconds).
REMAIN : Displays the remaining time of the track being played.
When the TIME button is pressed again, the remaining time on the disc being played will be displayed.
During program play, random play, delete or delete random play operations, the DISC REMAIN display will not be shown. Also, tracks above 24 will not be indicated on the REMAIN display.
TOTAL : Displays the total number of tracks on the disc (TRACK) and the overall playback time of disc will be displayed.
During playback, the display goes on for about 5 seconds before changing to the TIME display.
During programmed play, the TOTAL display will indicate the total number of tracks programmed (the total program time will not be displayed).

10. SPECIFICATIONS

Type ..... Compact disc digital audio system
Discs used ..... Compact disc
Frequency response ..... 2 Hz to 20 kHz
Number of channels ..... 2 channels (stereo)
Dimensions ..... 260 (W) × 84 (H) × 281 (D) mm
Weight ..... 3.0 kg

Accessories

- Six-compact disc magazine 1
- Operating Instructions 1

NOTE:

- *The specifications and design of this product are subject to change without notice, due to improvements.*

11. FOR AD, ABXJS, ABXJ, AEMXJ AND AEMXJS

CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

PD-P920M/AD, AEMXJ, AEMXJS, ABXJ, ABXJS and PD-P920M/AUC have the same construction except for the following:

Mark	Symbol & Description	Part No.						Remarks
		AUC Type	AD Type	AEMXJ Type	AEMXJS Type	ABXJ Type	ABXJS Type	
	Packing Case	PHG1802	PHG1777	PHG1744	PHG1836	PHG1744	PHG1836	
	Operating instructions (English)	.....	PRB1163	.....	.....	PRB1163	PRB1163	
	Operating instructions (English, French)	PRE1158	.....	.....	.....	.....	.....	
	Operating instructions (Spanish)	.....	PRC1041	.....	.....	.....	.....	
	Operating instructions (English, French, Dutch, Italian, German, Swedish, Spanish, Portuguese)	.....	.....	PRF1052	PRE1052	.....	.....	